Norsk institutt for luftforskning
Norwegian Institute for Air Research

MANUAL

An Open Source Air Quality Data Validation and e-Reporting System

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Preface

The Norwegian Institute for Air Research (NILU) has been commissioned to assist European Environmental Agency's work on air quality reporting. With the assistance of 4sfera, an open source tool has been developed Air Quality Raven tool. This document constitutes a User Guide for air quality experts using this tool.

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1 Summary

This document constitutes a User Guide for air quality experts using this tool.

The user guide includes:

- Log in
- Group options
- Management of meta-data with RAVEN
- XML generation
- Key elements for AQ e-Reporting

2 Introduction

RAVEN3 is a cross-platform independent air quality monitoring and e-reporting software package, and is tested on Windows, Linux and Mac OS. The overall concept is outlined in the image, below, in figure 1. The main e-reporting component was developed by NILU.

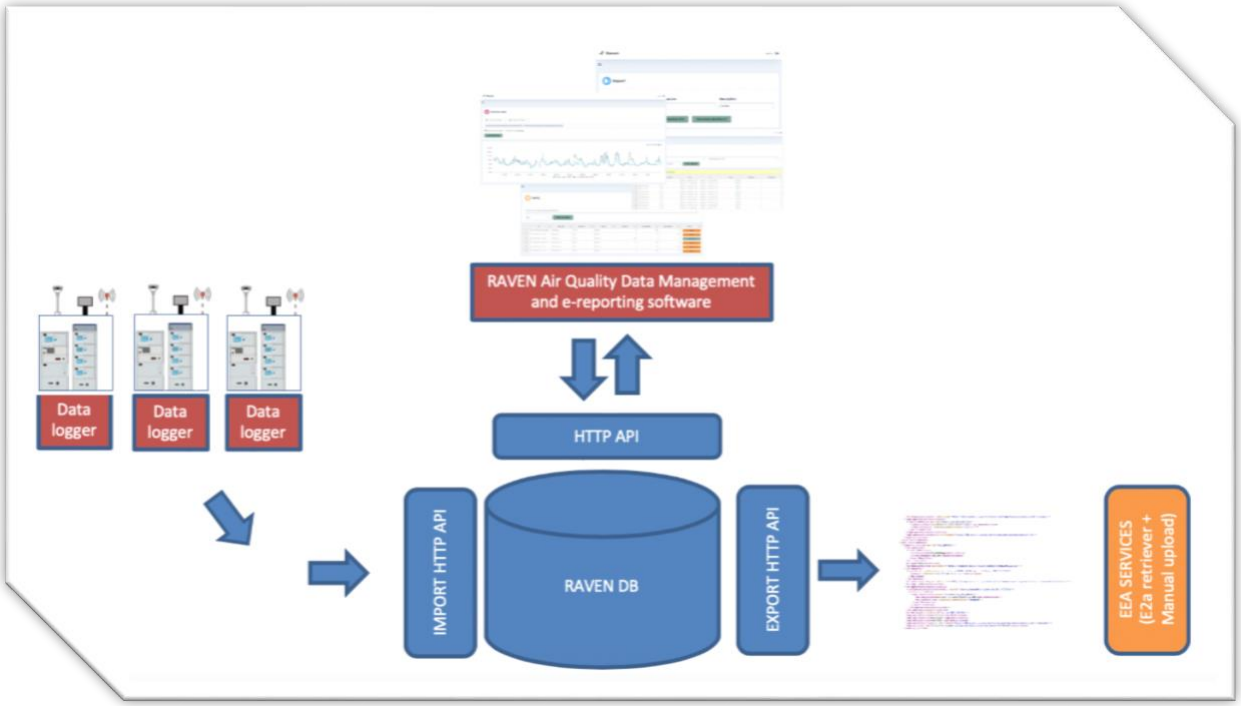


Figure 1: Data flow RAVEN

RAVEN has the following features:

- **Data import with csv files via GUI or API**
- **View and compare data module**
- **GUI for editing the following meta data:**
  - Responsible authorities
  - Networks
  - Stations
  - Sampling Point
  - Process
  - Samples
  - Observation Capabilities
  - Assessment Regimes
  - Attainments
  - Exceedance Description
- **Scaling, including unit conversion and calculate data (needed for NO-NO_2-NO_X)**
- **Validation module**
- **Verification module**
- **XML-generation via download or API for the following dataflows:**
  - information on zones and agglomerations (data flow B)
  - information assessment methods (data flow D)
  - information assessment regimes (data flow C)

- information on attainment of environmental compliance (data flow G)
- primary validated data (data flow E1a)
- primary Up-To-Date data (data flow E2a) NB! Only available through API

- **Users/groups read/write access on network level**

The database was designed as a relational model. The data model is shown in the figure below.

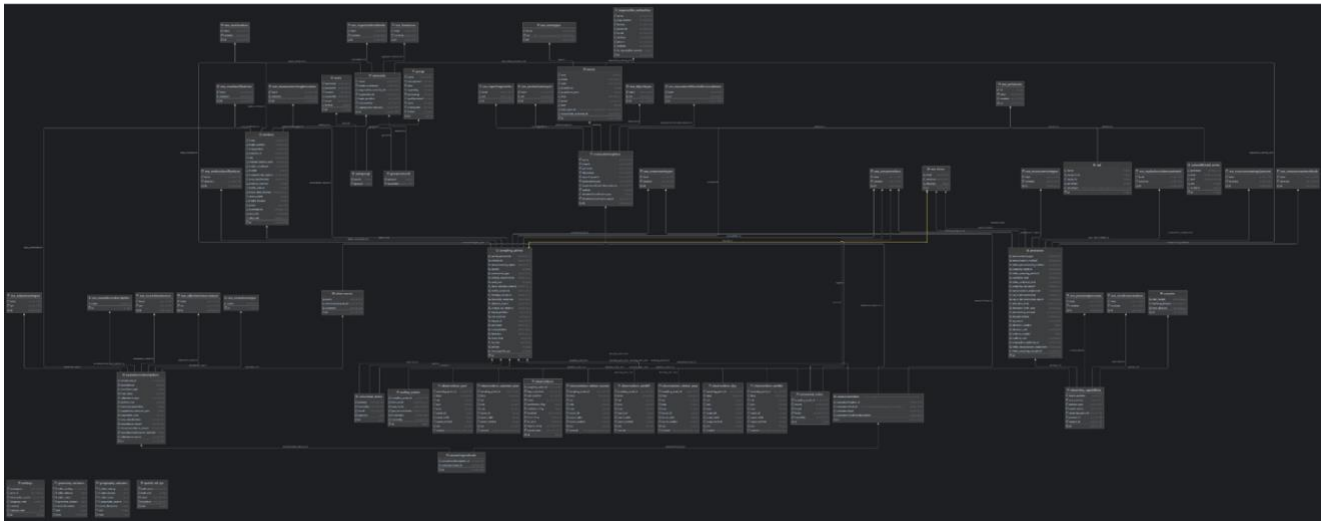


Figure 2: RAVEN database model

The full working software of RAVEN can be found and downloaded under the open source repository GitLab:

- https://git.nilu.no/raven/raven-administration

RAVEN Software requirements, installation and user documentation can also be found under:

- https://git.nilu.no/raven/raven-administration and
- https://git.nilu.no/raven/raven-administration/-/tree/master/guides

A demonstration version can be found at https://admin.demo.aqraven.eu/

Latest version of this document can be found:
https://git.nilu.no/raven/raven-administration/-/tree/master/guides/Raven_UserGuide.pdf

3 Introduction to e-Reporting

3.1 The legislative back drop

EU Member States are required to monitor and report air quality data under several EU legal instruments. This information is collated, analysed and disseminated by the European Environment Agency (EEA) supported by its European Topic Centre.

The introduction of the Commission's Implementing Decision 2011/850/EU[1] (AQ e-Reporting IPR) created a start point to rationalise, modernise and streamline air quality data reporting,

A key feature of the changes under the new e-Reporting system compared with its predecessor is the introduction of a new mechanism for data transfer. Under the new e-Reporting system data is to be transferred from Member States to the EEA in XML format. The XML schema and data model has been based on the standards, concepts and principles mandated by the INSPIRE Directive.

The AQ e-Reporting IPR came into force on 1 January 2014[2], two years after adoption of the Decision during which time Member States undertook preliminary tasks and activities to prepare themselves for e-Reporting. It was anticipated that Member States data infrastructure would require adaptation to allow:

1. Integration of data flows;
2. Data delivery that uses the defined transport mechanism (XML).

In recognition of the challenges that the new systems would present to Member States and to manage and facilitate the transition, Member State reporting authorities, their data providers, and the EEA's operational services have worked together to ensure that this transition to the e-Reporting is implemented in an as effective and efficient manner as possible. The EEA will establish and operate the mechanism for sharing air quality information (e-Reporting) in line with the AQD IPR requirements.

3.2 Online resources

To facilitate the implementation of the Decision 2011/850/EU, the European Environment Agency (EEA) has set up the Air Quality Portal to support the transition to e-Reporting. The AQ Portal, managed by ETC, is the central HUB for reporting air quality data across Europe via e-Reporting. The AQ Portal includes online resources for:

- Guidelines & reports for e-Reporting
  - http://www.eionet.europa.eu/aqportal/toolbox/guidance
- Controlled code lists and vocabularies for e-Reporting
  - http://www.eionet.europa.eu/aqportal/toolbox/lists
- The latest data model & AQD schemata
  - http://www.eionet.europa.eu/aqportal/toolbox/datamodel

The Commission has published two guidance notes to facilitate the implementation of the Decision:

[1] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2011.335.01.0086.01.ENG
[2] Although reporting of data flows B, C, and D is encouraged before the end of 2013.

- IPR guidance part I
  - http://ec.europa.eu/environment/air/quality/legislation/pdf/IPR_guidance1.pdf
- IPR guidance part II
  - http://ec.europa.eu/environment/air/quality/legislation/pdf/IPR_guidance2.pdf

EEA & ETC/ACM keep updated rules for submission at:
http://www.eionet.europa.eu/aqportal/toolbox/submission/
EEA & ETC/ACM has a dedicated helpdesk to assist countries at aqipr.helpdesk@eionet.europa.eu

3.3 Reporting data-flows

The AQ e-Reporting IPR integrates different air quality data-flows into the following groups:

- Data flow A – Reporting header & Competent Authority
- Data flow B – Information on zones
- Data flow C – Assessment regimes
- Data flow D– Assessment methods (Fixed and indicative)
- Data flow D1b – Assessment methods (models) – *under development*
- Data flow E1a – Primary validated data
- Data flow E1b – Model/Objective estimation data – u*nder development*
- Data flow E2a – Primary Up-To-Date data (*via FTP or service*)
- Data flow F – Aggregated data (*Performed by EEA*)
- Data flow G – Attainment
- Data flows H-K – Air quality plans & programmes (*Tool developed by JRC, Ispra*)

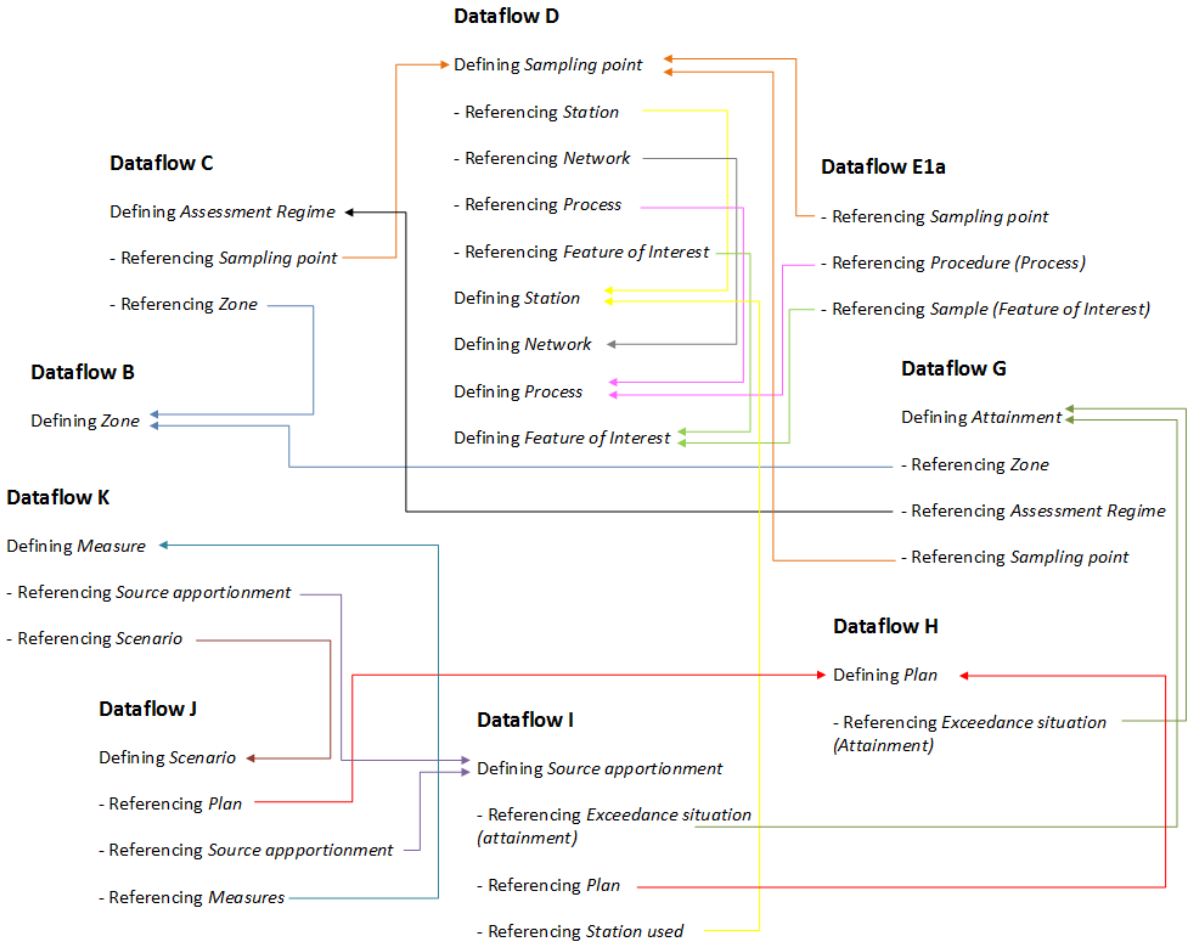


Figure 3: Key linkages between dataflows – diagram from AQ Portal

3.4 Reporting cycle

The air quality data flows are reported following the schedule set out in the Decision. The following data must be submitted accordingly:

- Preliminary data flows B and C containing information on zones and assessment regimes for the coming year YY+1. The deadline for submission is 31 December of year YY.
- Full information related to the previous year YY-1 with the associated data flows B, C, D, D1b, E1a, E1b and G. This delivery must be done by 30 September of year YY.
- Plans and Programs (data flow H-K) for (new) exceedances observed in year YY-2. The deadline for this package is 31 December of year YY.
- Provisional Up-To-Date measurement data (E2a). These data are transmitted hourly throughout the year via ftp.

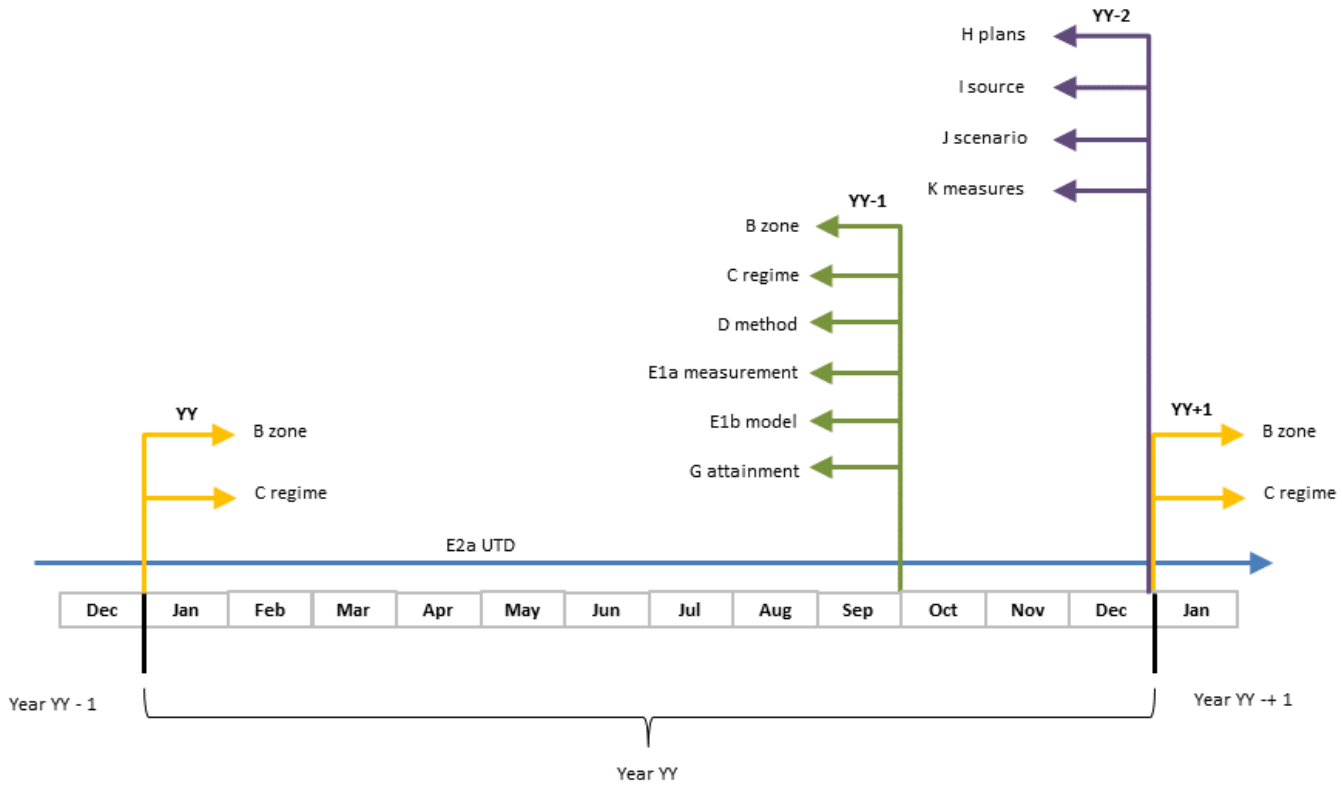


Figure 4: Reporting cycle – diagram from AQ Portal

4 Log in

To use Raven via GUI, logging is required. Go to the demonstration version at A https://admin.demo.aqraven.eu/loginBy default, credentials are:

Username: admin
Password: admin

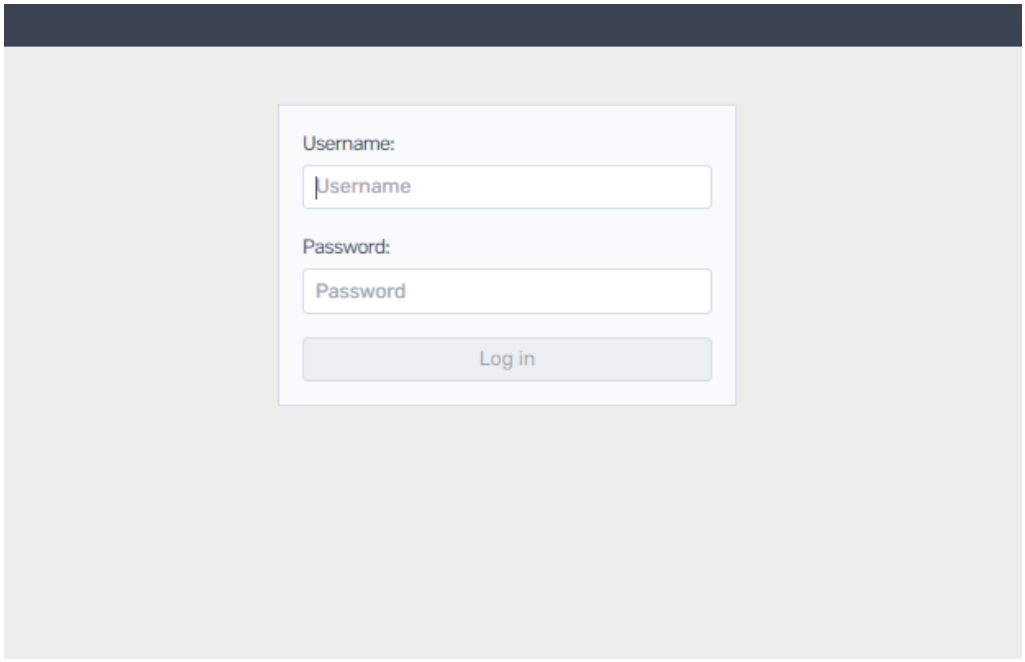
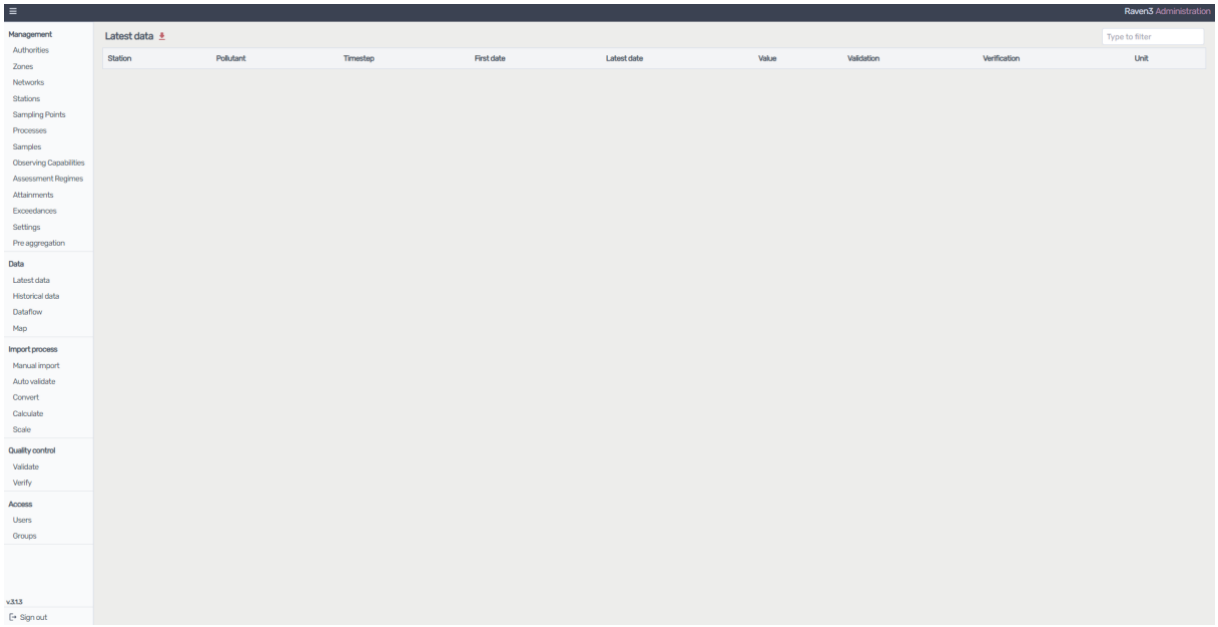


Figure 5: Login page

Once logged in, the following page will open and on the top left appears a menu icon. This is used to hide the menu to navigate in Raven.



igure 6: Raven main page

Raven includes 5 main areas:

- Management
- Data
-
- Import process
- Quality control
- Access

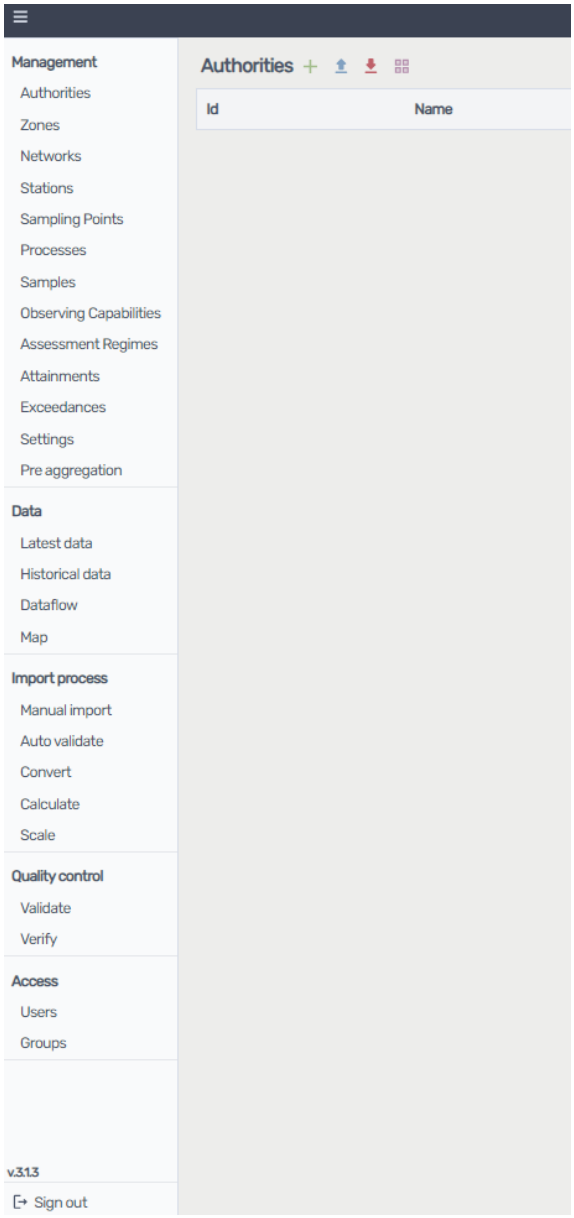


Figure 7: Raven's menu

NOTE: depending on the user group profile, the user will have access to different options within RAVEN.

5 Group profile

Raven's administrator can set up different user groups under the "Groups" section in the "Access" menu:

- Management
- Data
- EEA dataflow
- Processing

- Quality control
- Users
- All networks

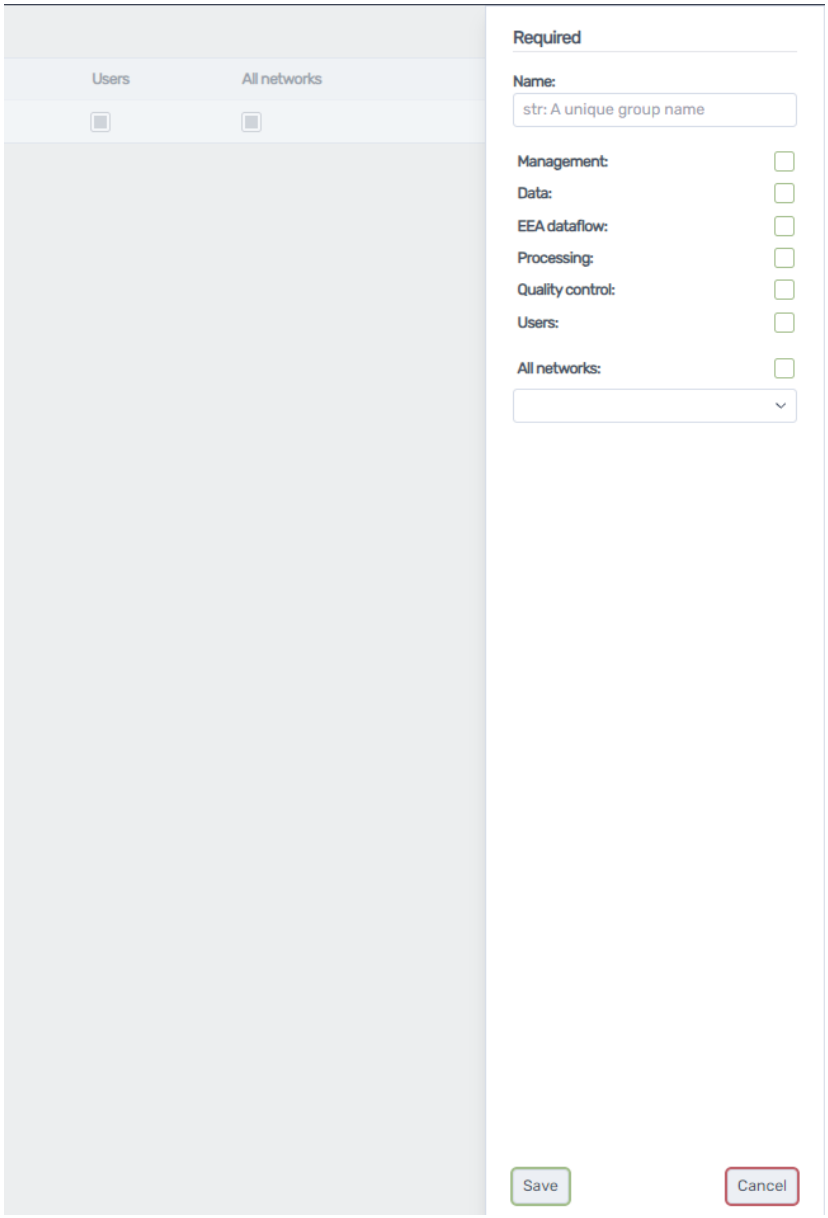


Figure 8: Raven's group profie

Each group can be set up to have access to the following functions:

- Network user:
    - Networks
    - Stations
    - Processes
    - Assessment regime
    - Attainment
- Observations user:

    - SamplingPoint
    - Samples
    - Observing capabilities
    - Observations
    - Historical data
- Export user:
    - Dataflows
- Quality control user:
    - Validate
    - Verify
- Processing
    - Scaled timeseries
    - Calculated timeseries
    - Converted timeseries
- Users:
    - Responsible authority
    - Users
    - Groups

On top of the functionalities, each individual group may have access to specific network. For example,

6 Management of meta-data

Raven provides a GUI to manage meta-data information for the different data flows:

- Dataflow D:
  - Responsible authorities
  - Networks
  - Stations
  - Sampling points
  - Processes
  - Samples
  - Observing capabilities
- Dataflow E1a/E2a
  - Observations
- Dataflow C
  - Assessment regime
- Dataflow G
  - Attainment
  - Exceedance Description

6.1 Data import with csv files via GUI or API

All meta-data is managed in a similar way regardless of dataflow. To import data for the first time, download the csv template from https://git.nilu.no/eea-tools/raven/-/tree/master/csv_examples and fill in the meta-data information according to e-Reporting requirements (see section 0). Figure 9 shows an example of CSV containing information on Authority.

responsible_authorities

id	name	organisation	address	locator	postcode	email	phone	website	is_responsible_reporter
AU1	Valentyna Vasylenko	MENR	Vasylia Lypkivskoho Street 35	Kyiv		vasilenko@menr.gov.ua		http://www.menr.gov.ua	TRUE

Figure 9: CSV example of Authority

Click on the specific element to import data (See Figure 10 for Authorities) and the corresponding page will open as seen in Figure 11.

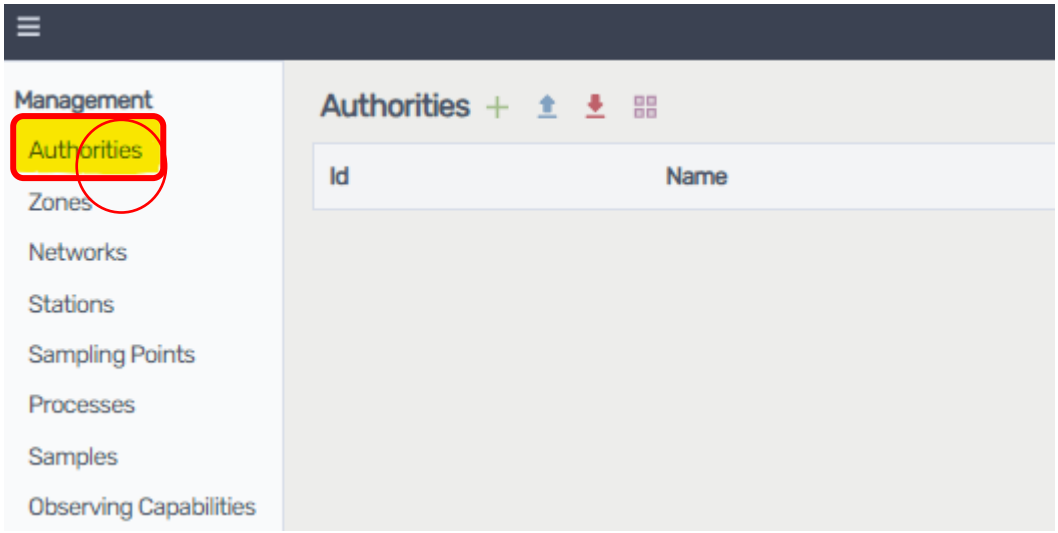


Figure 10: Select Authorities section

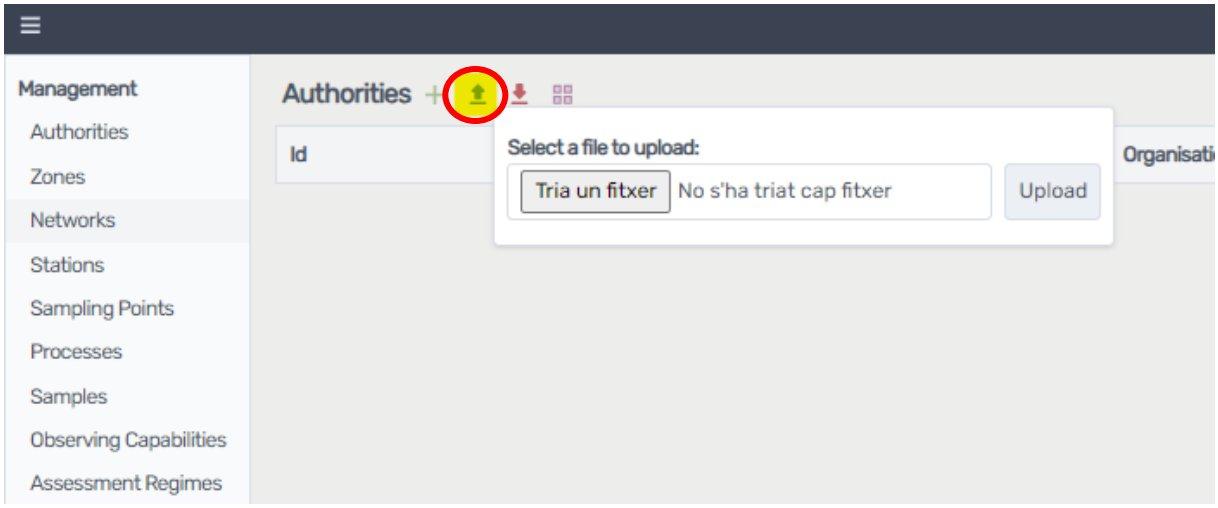


Figure 11: Authority GUI page

To import the CSV, click on the “Select a file” icon as seen in Figure 12 and look for the CSV file in your computer. Once selected, click on “Upload” button. If CSV is complete and correctly formatted, it will be uploaded successfully.

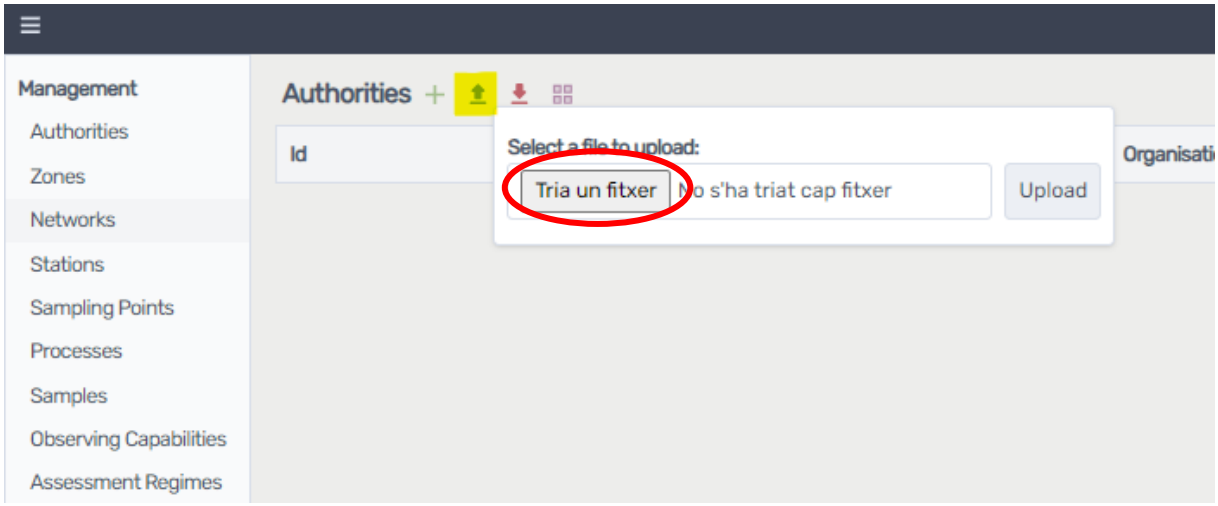


Figure 12: Authority GUI page

These steps will be necessary for all dataflows.

6.2 View data

Data imported into Raven can be visualised using the lateral menu. Click on the specific element to view data (See Figure 13 for Authorities) and the corresponding page will open as seen in Figure 14. Now the imported data is shown in tabular format.

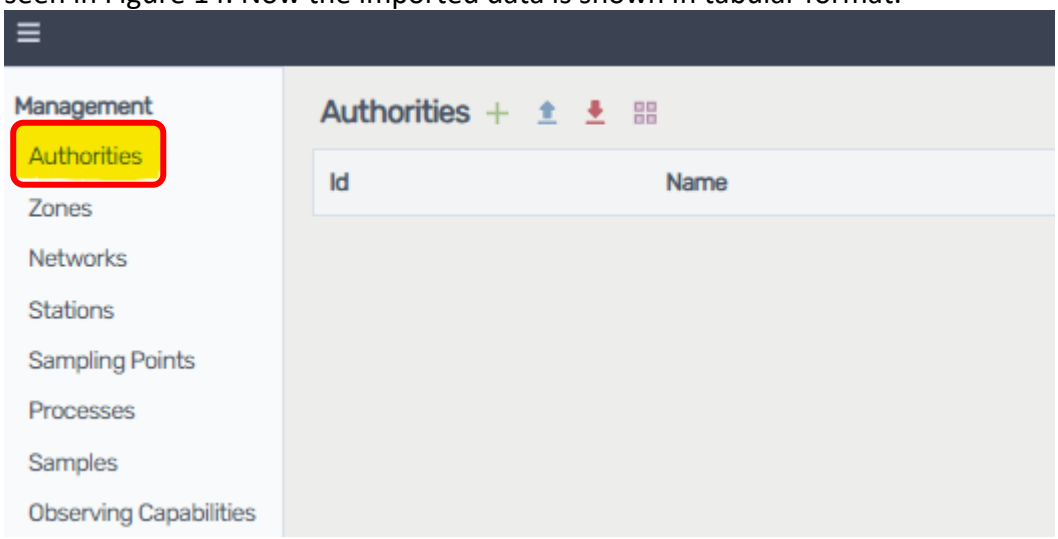


Figure 13: Select Authorities section

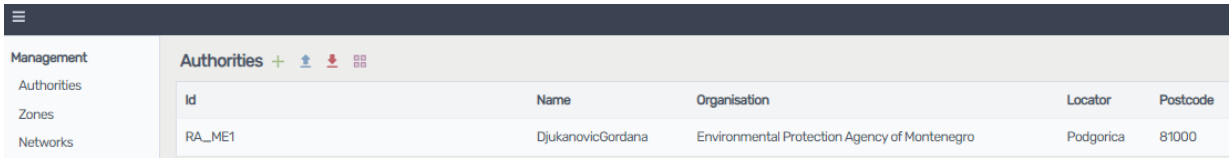
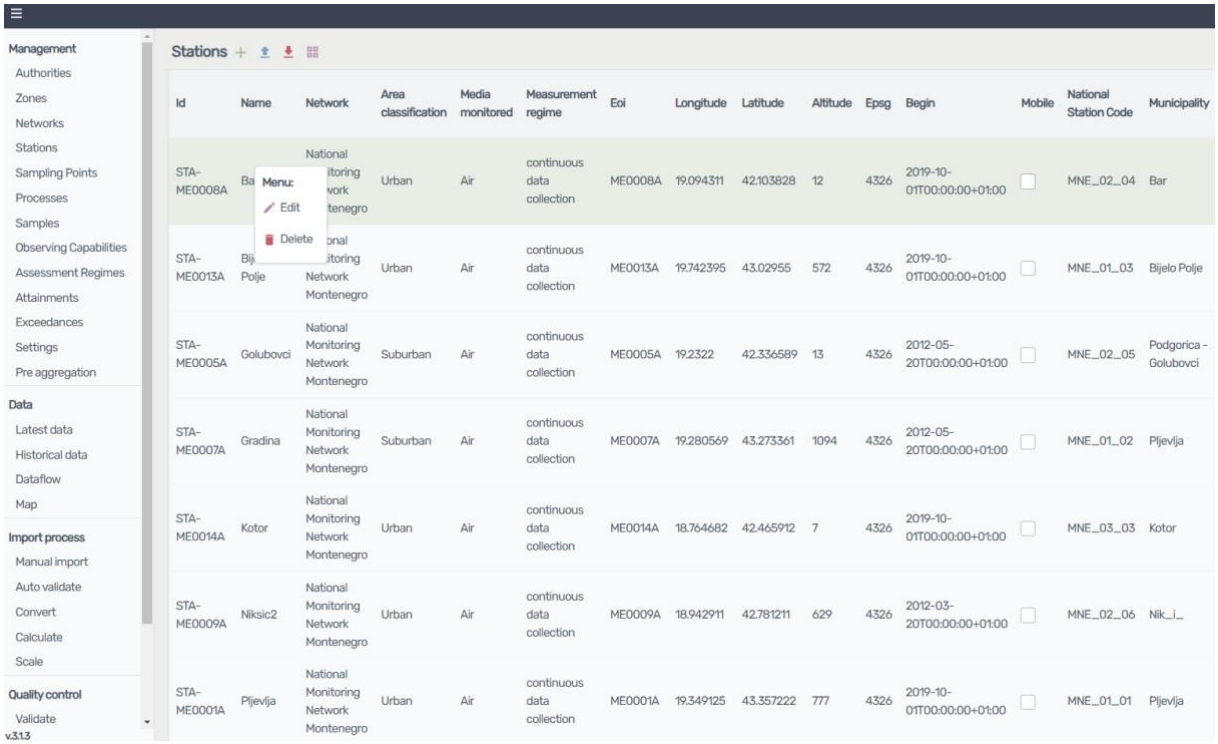


Figure 14: Authorities GUI page with imported data

6.3 Edit meta-data with GUI

Data can be edited via CSV or via GUI interface. If data is edited via CSV, amend the data in the CSV and re-upload the data following instruction in section 6.1).
Inside the specific GUI page, right click on the row to be edited. As seen in Figure 15, a menu appears with the following twooptions available:

- Edit
- Delete



Id	Name	Network	Area classification	Media monitored	Measurement regime	Eoi	Longitude	Latitude	Altitude	Epsg	Begin	Mobile	National Station Code	Municipality
STA-ME0008A	Ba	National itoring vork tenegro	Urban	Air	continuous data collection	ME0008A	19.094311	42.103828	12	4326	2019-10-01T00:00:00+01:00		MNE_02_04	Bar
STA-ME0013A	Bij Polje	onal itoring Network Montenegro	Urban	Air	continuous data collection	ME0013A	19.742395	43.02955	572	4326	2019-10-01T00:00:00+01:00		MNE_01_03	Bijelo Polje
STA-ME0005A	Golubovci	National Monitoring Network Montenegro	Suburban	Air	continuous data collection	ME0005A	19.2322	42.336589	13	4326	2012-05-20T00:00:00+01:00		MNE_02_05	Podgorica - Golubovci
STA-ME0007A	Gradina	National Monitoring Network Montenegro	Suburban	Air	continuous data collection	ME0007A	19.280569	43.273361	1094	4326	2012-05-20T00:00:00+01:00		MNE_01_02	Pljevlja
STA-ME0014A	Kotor	National Monitoring Network Montenegro	Urban	Air	continuous data collection	ME0014A	18.764682	42.465912	7	4326	2019-10-01T00:00:00+01:00		MNE_03_03	Kotor
STA-ME0009A	Niksic2	National Monitoring Network Montenegro	Urban	Air	continuous data collection	ME0009A	18.942911	42.781211	629	4326	2012-03-20T00:00:00+01:00		MNE_02_06	Nik_i_
STA-ME0001A	Pljevlja	National Monitoring Network Montenegro	Urban	Air	continuous data collection	ME0001A	19.349125	43.357222	777	4326	2019-10-01T00:00:00+01:00		MNE_01_01	Pljevlja

Figure 15: Authority GUI page with imported data

Edit will allow the update of meta-data row using the form as seen in Figure 16. Once information is updated, click on “Save” to store this in the database or click “Cancel” to ignore any updates.

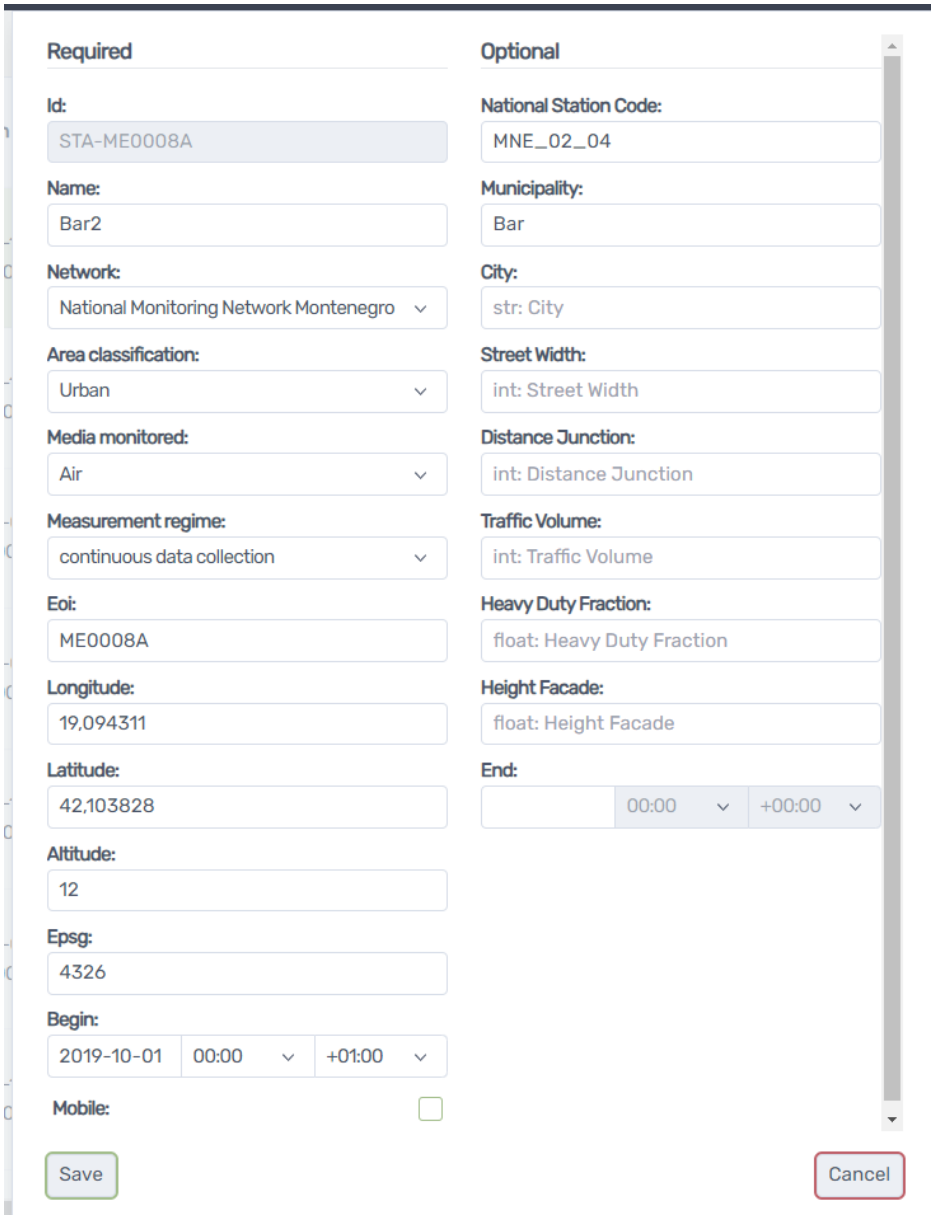


Figure 16: Raven's meta-data edit form

To create a new entry to the specific meta-data, click the green cross as seen in Figure 17. Then, enter de information as done before in Figure 13 and click on “Save” to store this in the database or click “Cancel” to ignore any new entry.

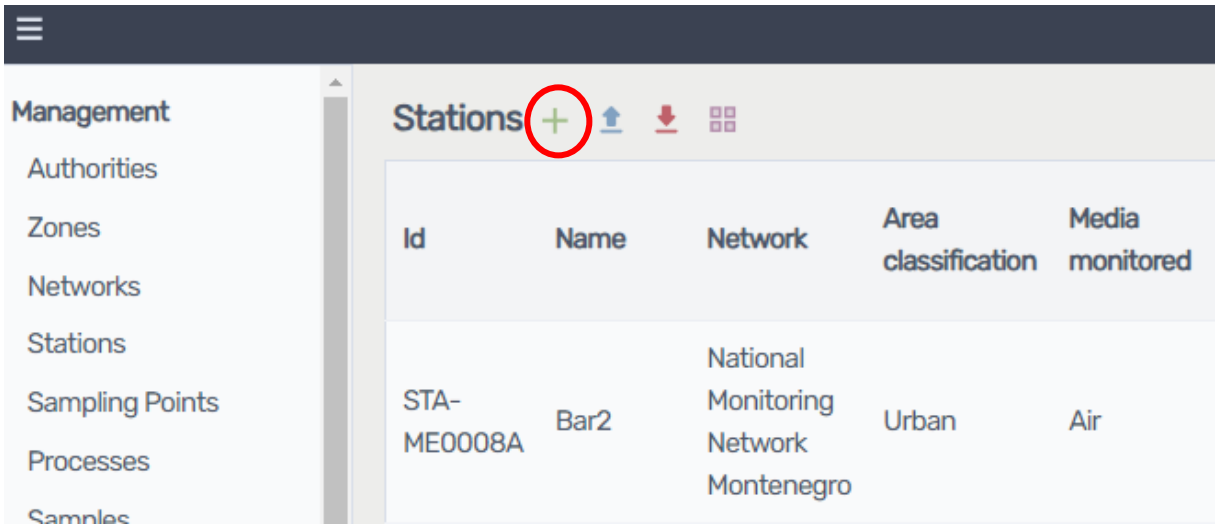


Figure 17: Raven’s meta-data new entry

Delete will remove the particular row from the database.

6.4 Dataflow D

Under the IPR Decision, reporting countries must report on the assessment methods established for the purposes of air quality assessment and management. The legal obligations for reporting are set out in Article 7 & 8 of the Decision.

A retrospective report must be reported by 30 September each year to confirm the methods that the reporting country implemented for the assessment and management of air quality. However, data flow D should be kept up to date as far as possible throughout the year to ensure correct processing of UTD data.

Retrospective (backward-looking) report by 30 September in year X to inform on country's AQ assessment methods for year X-1. In practice, dataset D should be kept updated as far as possible.

The metadata for fixed and indicative measurements is grouped into:

- AQD_Network
- AQD_Station
- AQD_SamplingPoint
- AQD_SamplingPointProcess
- AQD_Sample

Some elements are linked to others and these relationships are important for reporting metadata correctly.

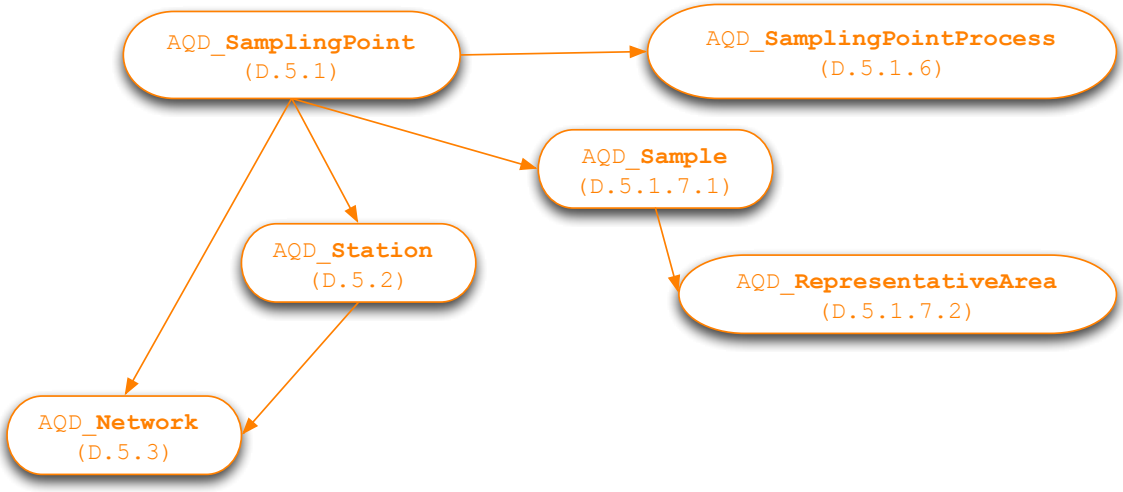


Figure 18: Linkages between fixed measurement elements (simple example) – from the User Guide

In Raven, the above configuration is carried out via 7 data templates:

- Networks
- Stations
- Sampling points
- Processes
- Samples
- Observing capabilities (which links all the elements)

6.5 Dataflow E1a/E2a

Under the IPR Decision, each country must report measurement data from all Assessment Methods established for the purposes of air quality assessment and management and exchange of information. The legal obligations for reporting of these data are set out in Article 10.

For assessment data from fixed and indicative measurements, data flow E shall be reported as Primary validated assessment data (**E1a**).

The primary validated data is a mandatory data flow for pollutants with environmental objectives covered by Directive 2004/107/EC and Directive 2008/50/EC.

Data flow E1a links to

- Assessment Methods (D) linkage to AQD_SamplingPoint
- Assessment Methods (D) linkage to AQD_SamplingPointProcess
- Assessment Methods (D) linkage to AQD_Sample

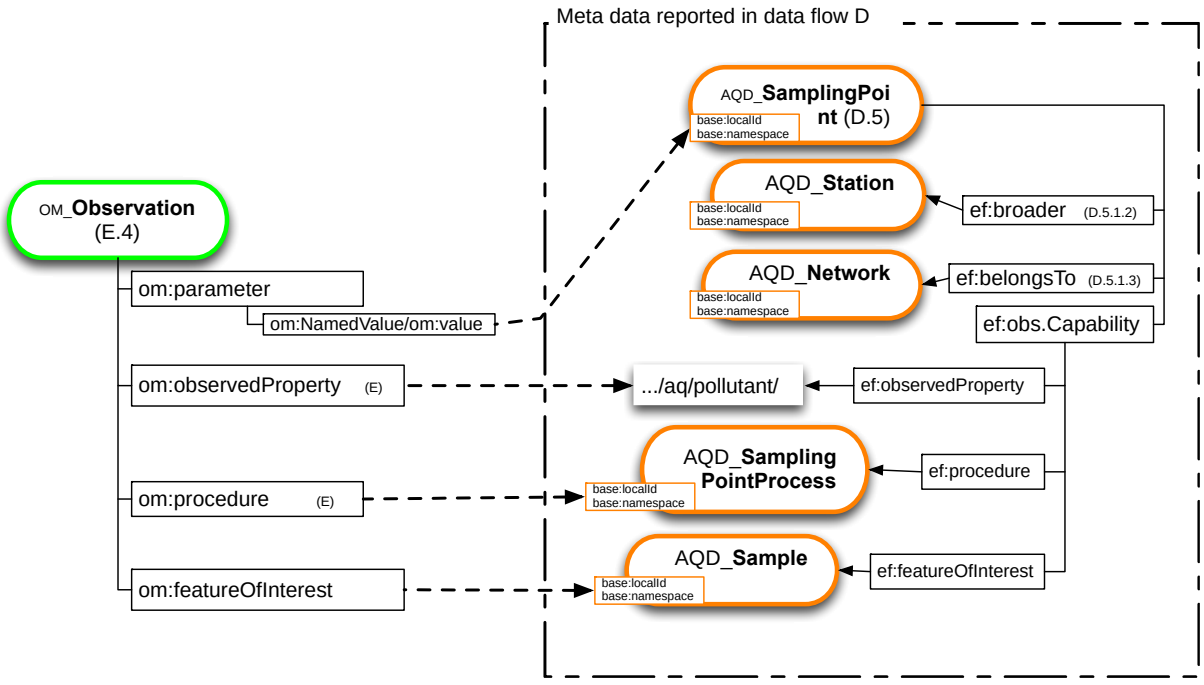


Figure 19: Key linkage between E1a and D

Raven ensures that the relationship of key elements is maintained. To link the observation with the timeseries, the user only needs to specify the samplingpoint ID in the Observations template

6.6 Dataflow C

The Assessment Regime data flow allows for comprehensive description of the assessment methods used in each zone to fulfill the air quality directive. This obligation is set out in Article 7 of the Decision.

The Air Quality Assessment Regime data flow is a mandatory data flow for pollutants covered by Directive 2004/107/EC and Article 4 of Directive 2008/50/EC. The table below lists all mandatory pollutants including their related Protection Target. In addition, in formation about designated competent authorities and bodies responsible for different aspects of quality assurance must be provided under this data flow.
Data flow C must be reported in the following envelopes:

- **C_preliminary**
  Forward looking report by 31st December each year with Assessment Regime for the management of air quality in the coming calendar year (year X+1).
- **Retrospective**
  Report by 30 September in year X to inform on the AQ Assessment for year X-1

Each assessment regime Environmental objective type is a complex datatype with 3 elements used for describing the applicable AQ environmental objective as a combination of its components:

- Objective Type,
- Reporting Metric and
- Protection Target.

Pollutant*	objectiveType**	reportingMetric***	protectionTarget****
1	LV	hrsAbove	H
1	LV	daysAbove	H
1	CL	aMean	V
1	CL	wMean	V
7	TV	daysAbove-3yr	H
7	LTO	daysAbove	H
7	TV	AOT40c-5yr	V
7	LTO	AOT40c	V
8	LV	hrsAbove	H
8	LV	aMean	H
8	ALT	3hAbove	H
9	CL	aMean	V
5	LV	daysAbove	H
5	LV	aMean	H
6001	ECO	AEI	H
6001	ERT****	AEI	H
6001	LV	aMean	H
6001	TV	aMean	H
10	LV	daysAbove	H
5012	LV	aMean	H
20	LV	aMean	H
5014	TV	aMean	H
5018	TV	aMean	H
5015	TV	aMean	H
5029	TV	aMean	H
Pollutants with Monitoring Objective	MO	NA	NA

* http://dd.eionet.europa.eu/vocabulary/aq/pollutant/** http://dd.eionet.europa.eu/vocabulary/aq/objectivetype/ *** http://dd.eionet.europa.eu/vocabulary/aq/reportingmetric/ ****http://dd.eionet.europa.eu/vocabulary/aq/protectiontarget/
**** *Currently not reported*

In Raven, the above configuration is carried out via one data templates:

- Assessment regime

6.7 Dataflow G

The Attainiment data flow (G) Under the IPR Decision, provides information on the attainment (or otherwise) of the environmental objectives set by AQ Directives. This data flow allows for comprehensive description of the declaration of attainment for all environmental objectives in each zone or agglomeration. This obligation is set out in Article12 of the Decision.

Key information to be reported includes:

(i) Links to the AQ zone (data flow B) for the same calendar year,
(ii) Links to the assessment regimes declared within data flow C for the same zone and calendar year
(iii) Declaration of exceedance as TRUE or FALSE.
(iv) Numerical exceedance or number exceedance for the Environmental Objective
(v) Links to the exceeding assessment methods(s) declared with data flow D and D1b

The AQ attainment data flow is a mandatory data flow for pollutants with environmental objectives covered by Directive 2004/107/EC and Directive 2008/50/EC. Confirmation of exceedances of the Information and Alert thresholds based on valid measurements for pollutants that have these thresholds is excluded from the Attainment data flow.

Data flow G must be reported:

- Retrospective (backward-looking) report by 30 September in year X to inform on the AQ Attainment for year X-1

In Raven, the above configuration is carried out via two data templates:

- Attainment
- Exceedance Description

7 XML generation via download or API

Raven platform allows the generation of the XML to be reported to EEA for all dataflows. Click on the Dataflows section from main menu.

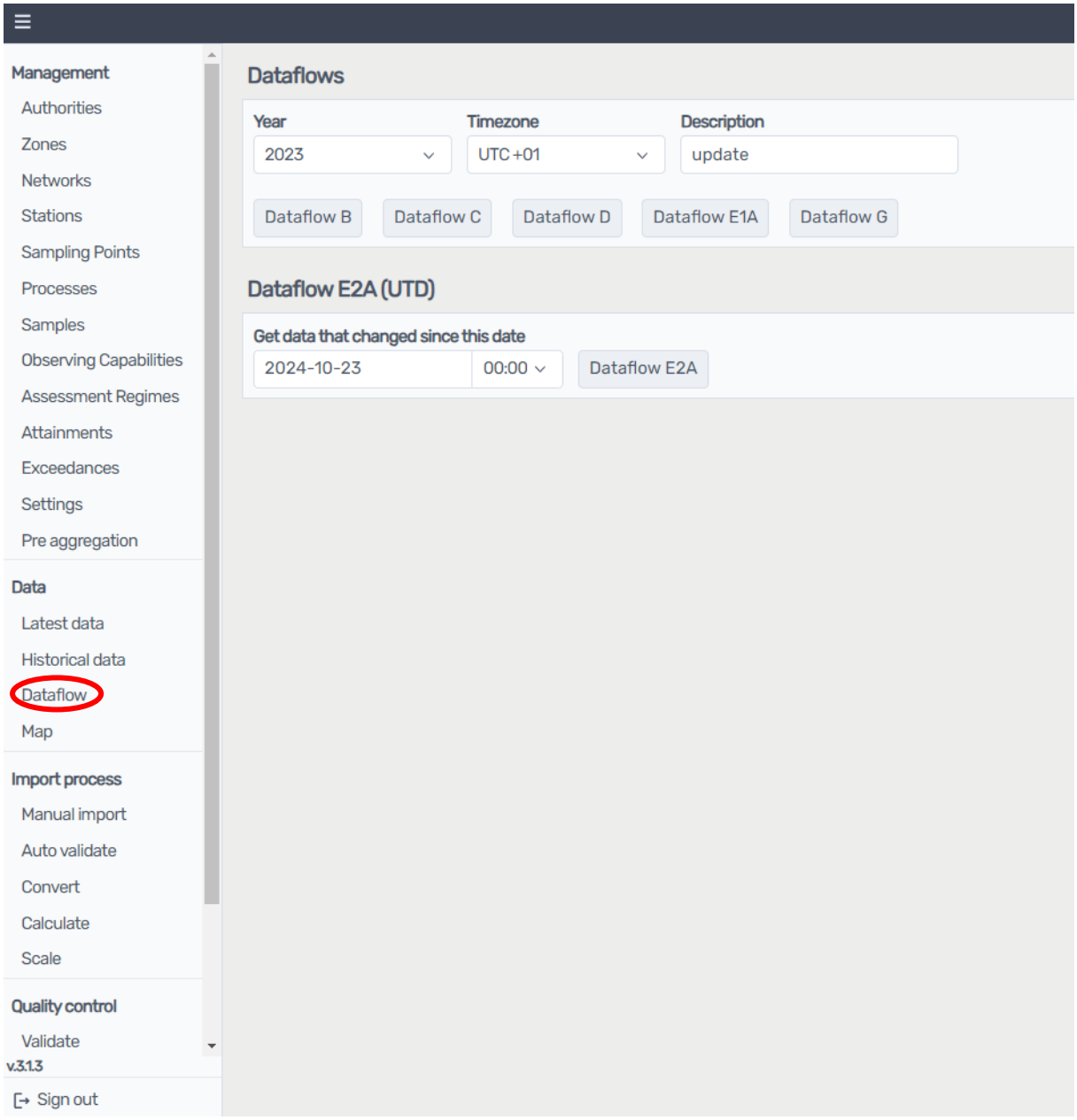


Figure 20: Dataflows section for XML export

Select the **Year**, the **time zone** and provide a **Description** and click on the specific "Dataflow" to export Raven.

However, before we can download the data according to the 'Dataflow' of interest, we must make sure that all the files needed for the analysis are correctly uploaded to Raven. So, for each Dataflow we need different files:

- **Dataflow B**: Authorities & Zones
- **Dataflow D**: Network, Stations, Sampling Points, Processes, Samples & Observing Capabilities.

- **Dataflow C**: Assessment Regimes & all the documents that have been previously uploaded to *Dataflow D and B.*
- **Dataflow G**: Attainments, Exceedances & all documents required for *Dataflow C.*
- **Dataflow E1a**: This can be done in two different ways, through a manual import (in the 'Import process' side menu) or automatically (better specify how).

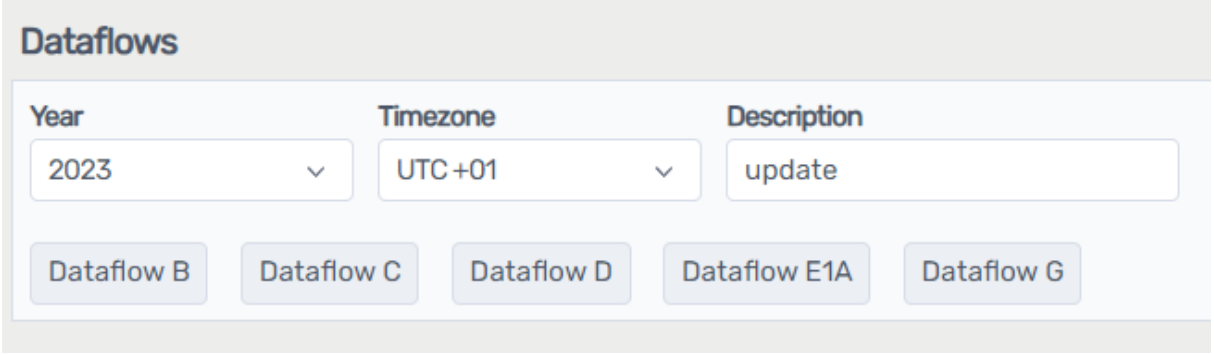


Figure 21: Dataflows export section


```
▼<gml:FeatureCollection xmlns:ad="urn:x-inspire:specification:gmlas:Addresses:3.0"
 xmlns:aqd="http://dd.eionet.europa.eu/schemaset/id2011850eu-1.0" xmlns:base="http://inspire.ec.europa.eu/schemas/base/3.3"
 xmlns:base2="http://inspire.ec.europa.eu/schemas/base2/1.0" xmlns:ef="http://inspire.ec.europa.eu/schemas/ef/3.0"
 xmlns:gco="http://www.isotc211.org/2005/gco" xmlns:gmd="http://www.isotc211.org/2005/gmd"
 xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:gn="urn:x-inspire:specification:gmlas:GeographicalNames:3.0"
 xmlns:ompr="http://inspire.ec.europa.eu/schemas/ompr/2.0" xmlns:sam="http://www.opengis.net/sampling/2.0"
 xmlns:sams="http://www.opengis.net/samplingSpatial/2.0" xmlns:xlink="http://www.w3.org/1999/xlink"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" gml:id="D_FeatureCollection"
 xsi:schemaLocation="http://dd.eionet.europa.eu/schemaset/id2011850eu-1.0 http://dd.eionet.europa.eu/schemas/id2011850eu-
 1.0/AirQualityReporting.xsd">
  ▼<gml:featureMember>
    ▼<aqd:AQD_ReportingHeader gml:id="D_ReportingHeader">
       <aqd:change>true</aqd:change>
       <aqd:changeDescription>Update</aqd:changeDescription>
      ▼<aqd:inspireId>
        ▼<base:Identifier>
           <base:localId>ReportingHeader_D</base:localId>
           <base:namespace>UA.AQD</base:namespace>
         </base:Identifier>
       </aqd:inspireId>
      ▼<aqd:reportingAuthority>
        ▼<base2:RelatedParty>
          ▼<base2:individualName>
             <gco:CharacterString>Valentyna Vasylenko</gco:CharacterString>
           </base2:individualName>
          ▼<base2:organisationName>
             <gco:CharacterString>MENR</gco:CharacterString>
           </base2:organisationName>
          ▼<base2:contact>
            ▼<base2:Contact>
              ▼<base2:address>
                ▼<ad:AddressRepresentation>
                  ▼<ad:adminUnit>
                    ▼<gn:GeographicalName>
                       <gn:language/>
                       <gn:nativeness nilReason="missing" xsi:nil="true"/>
                       <gn:nameStatus nilReason="missing" xsi:nil="true"/>
                       <gn:sourceOfName nilReason="missing" xsi:nil="true"/>
                       <gn:pronunciation nilReason="missing" xsi:nil="true"/>
                      ▼<gn:spelling>
                        ▼<gn:SpellingOfName>
                           <gn:text>Vasylia Lypkivskoho Street 35</gn:text>
                           <gn:script nilReason="missing" xsi:nil="true"/>
                         </gn:SpellingOfName>
                       </gn:spelling>
                     </gn:GeographicalName>
                   </ad:adminUnit>
                   <ad:locatorDesignator>Kyiv</ad:locatorDesignator>
                   <ad:postCode>03035</ad:postCode>
                 </ad:AddressRepresentation>
               </base2:address>
               <base2:electronicMailAddress>vasilenko@menr.gov.ua</base2:electronicMailAddress>
               <base2:telephoneVoice>+380964337953</base2:telephoneVoice>
               <base2:website>http://www.menr.gov.ua</base2:website>
             </base2:Contact>
           </base2:contact>
```

Figure 23: XML example

ADD API to generate all dataflows

8 Management of timeseries

Raven provides a GUI to visualise air quality monitoring data which has been imported into Raven (Historical data) and visualise latest data in tabular format (Latest data). . Moreover, it includes two new functionalities to...

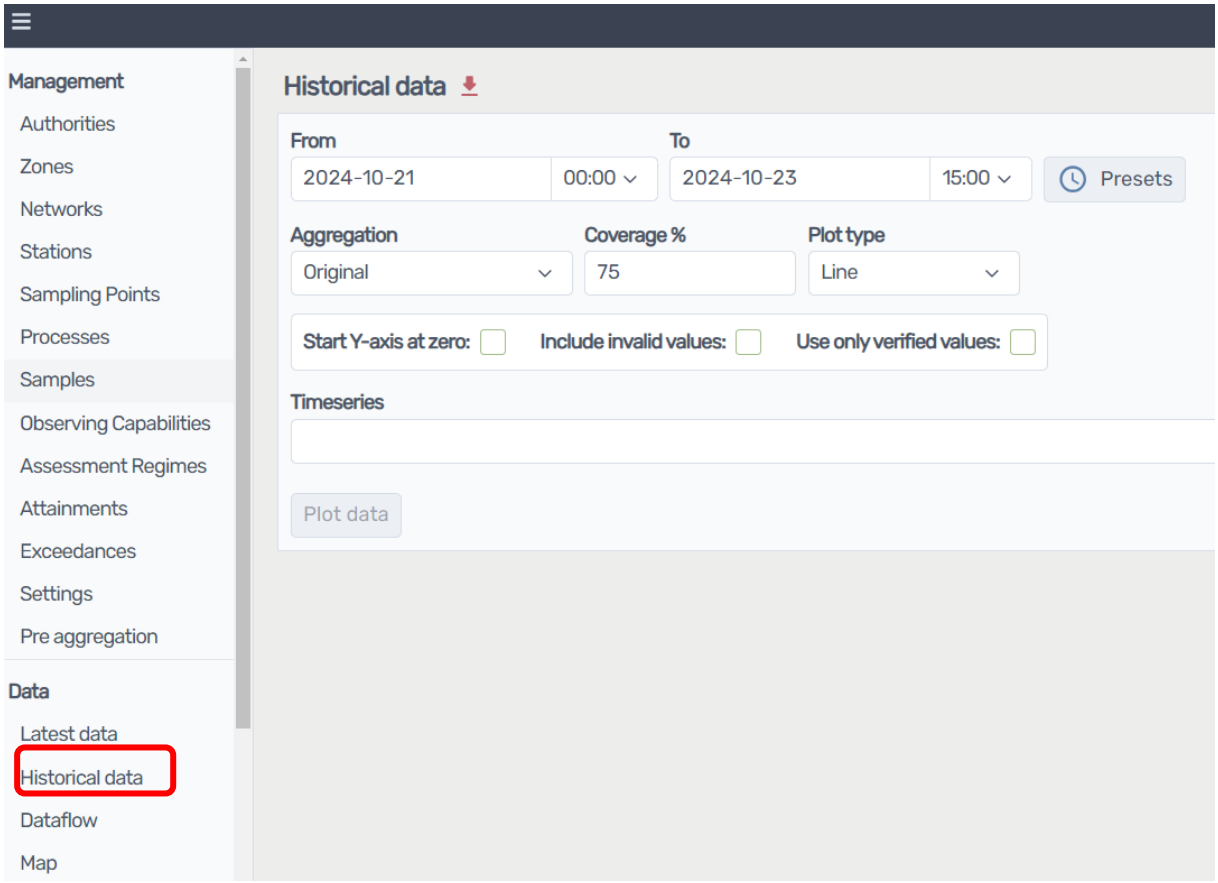
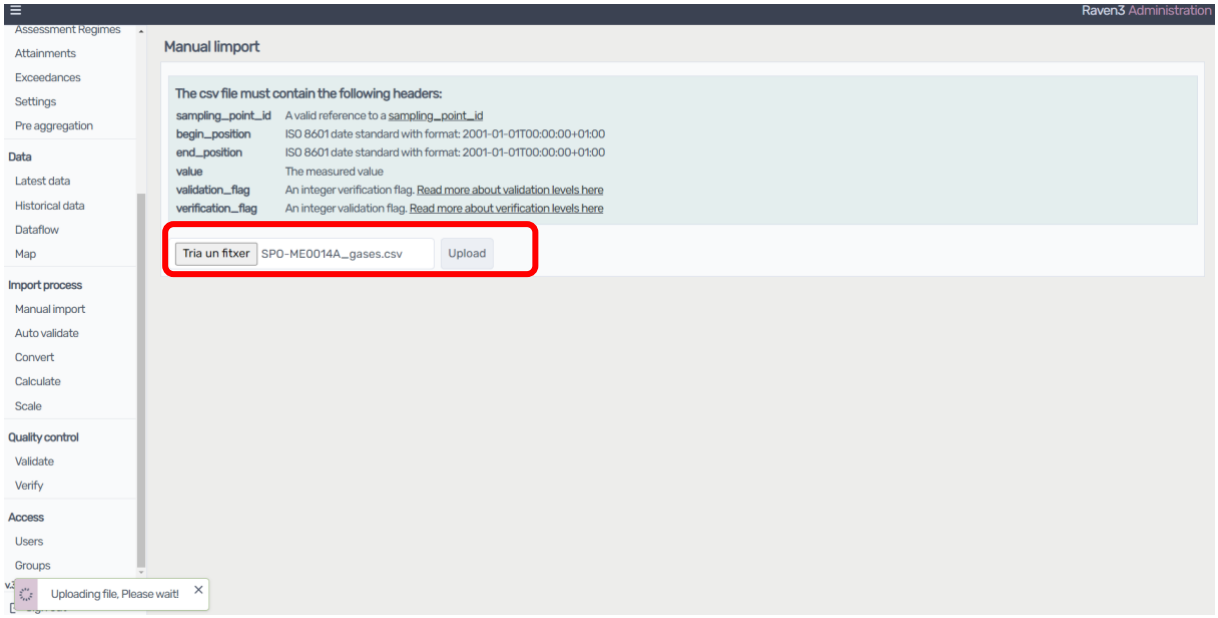


Figure 24: Historical data section for visualising timeseries

In order to visualise the data, first we must follow the steps specified on page 39 & 40, then, the following steps are necessary:

1) Firstly, import the data in the section Data > Manual import as shown in Figure X (need to check which number figure is it)



2) Select the period of interest in the “From” (day + hour) and “To” (day + hour) section. There’s the “Presets” option that let you choose automatically:
    a. This week
    b. Last week
    c. This month
    d. Last month
    e. This year
    f. Last year
3) Select how data should be displayed regarding the type of “Aggregation”
4) Choose the “Coverage (%)” percentage
5) Choose the “Plot type”, line or bar graph
6) There’s the option to choose if you want to display or change the following parameters in the graphic:
    a. Start Y-axis at zero
    b. Include invalid values
    c. Use only verified values
7) Finally, select the “Timeseries” to be displayed on the graph

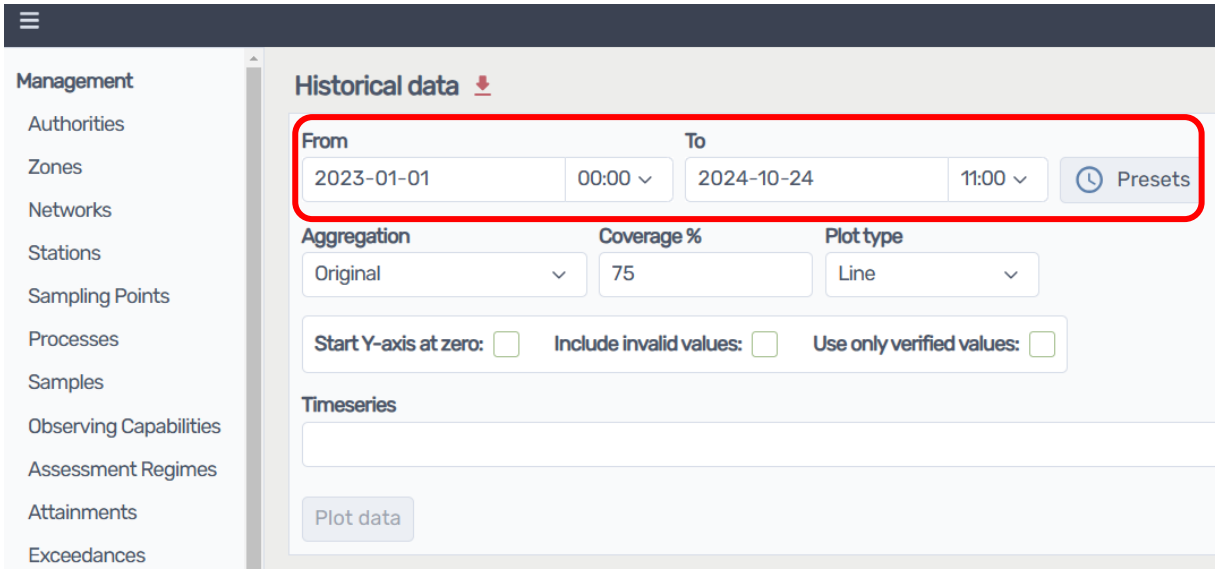


Figure 25: Historical data - select period of interest

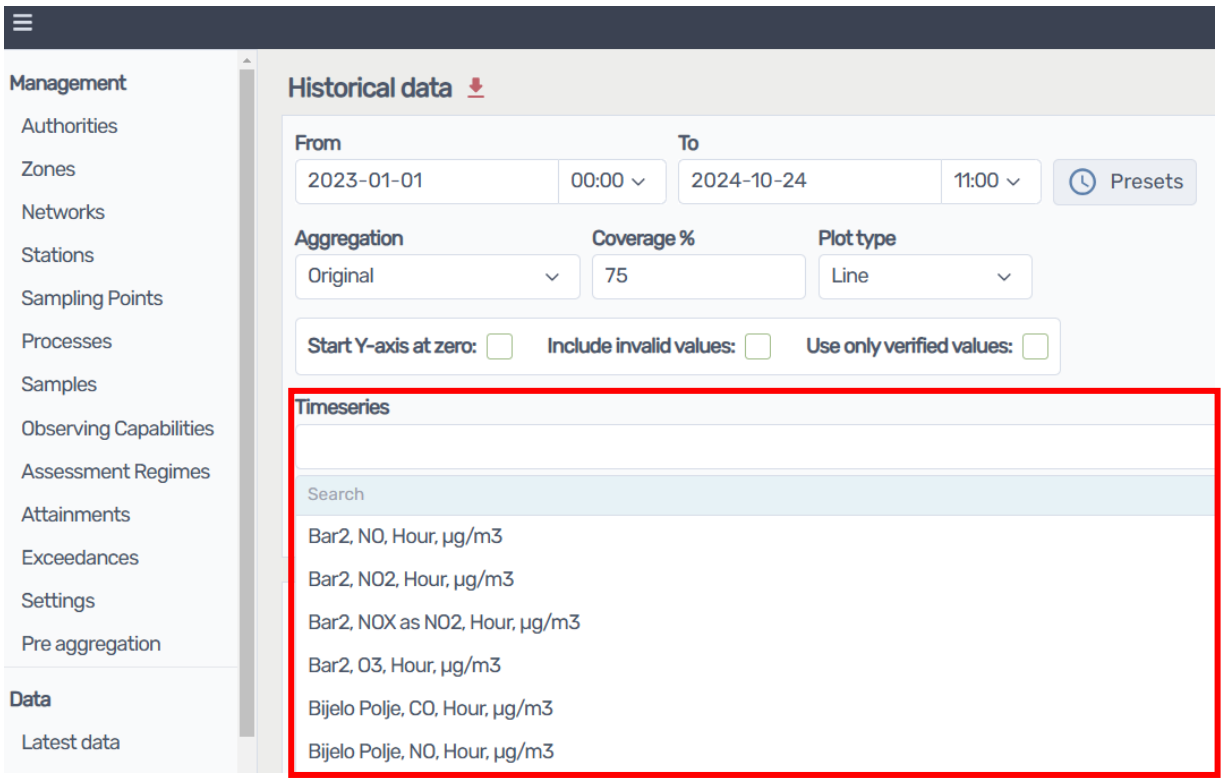


Figure 26: Historical data section – list of available timeseries within selected period

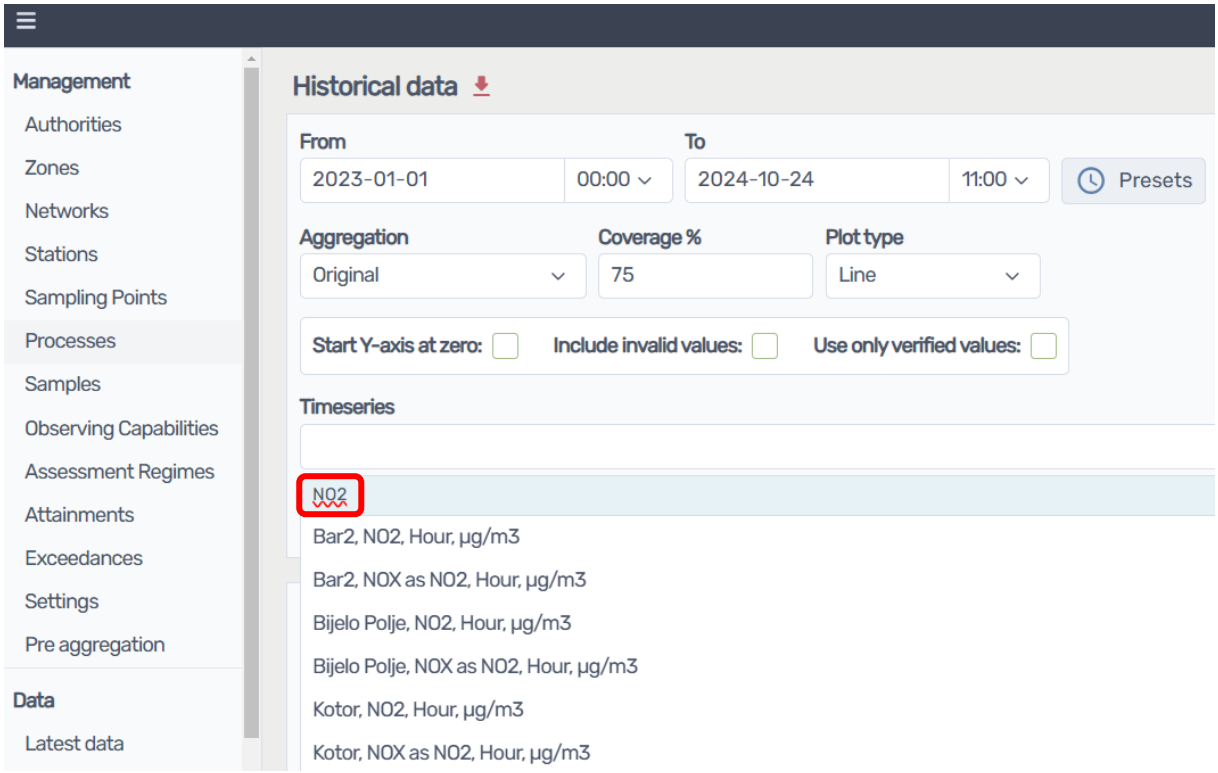


Figure 27: Historical data section – use search function to narrow down list of timeseries

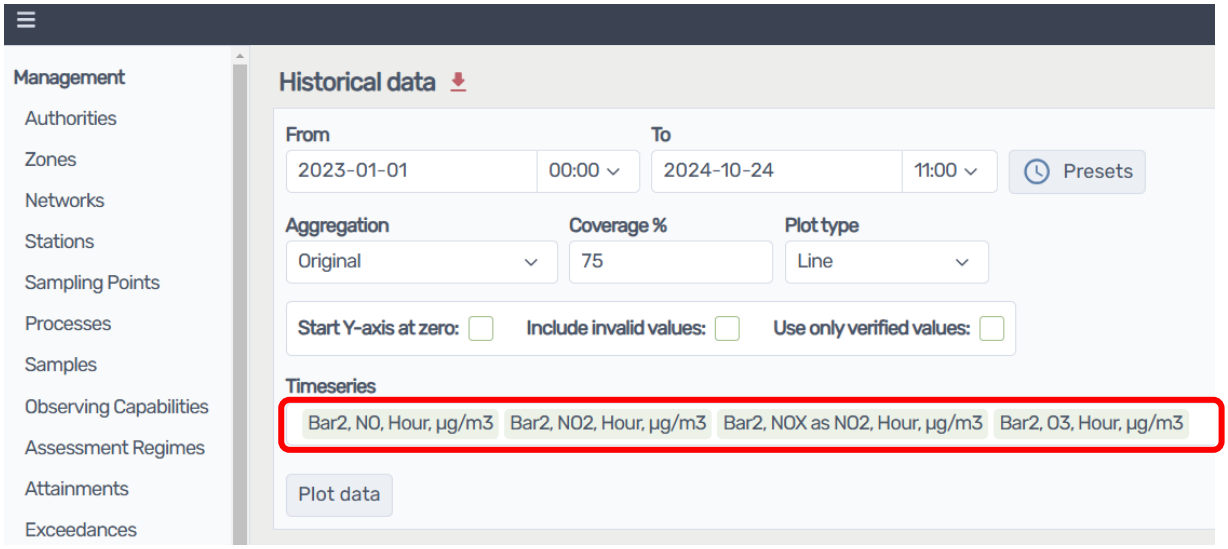


Figure 28: Historical data section – select timeseries to visualise

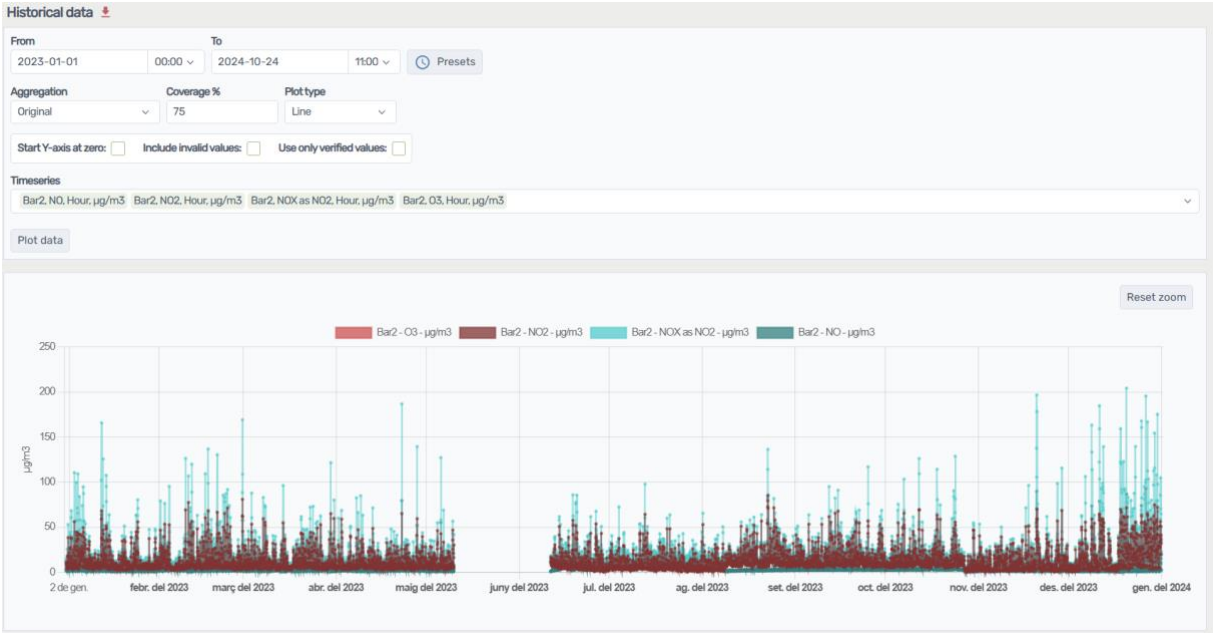


Figure 29: Historical data section – visualisation of selected timeseries

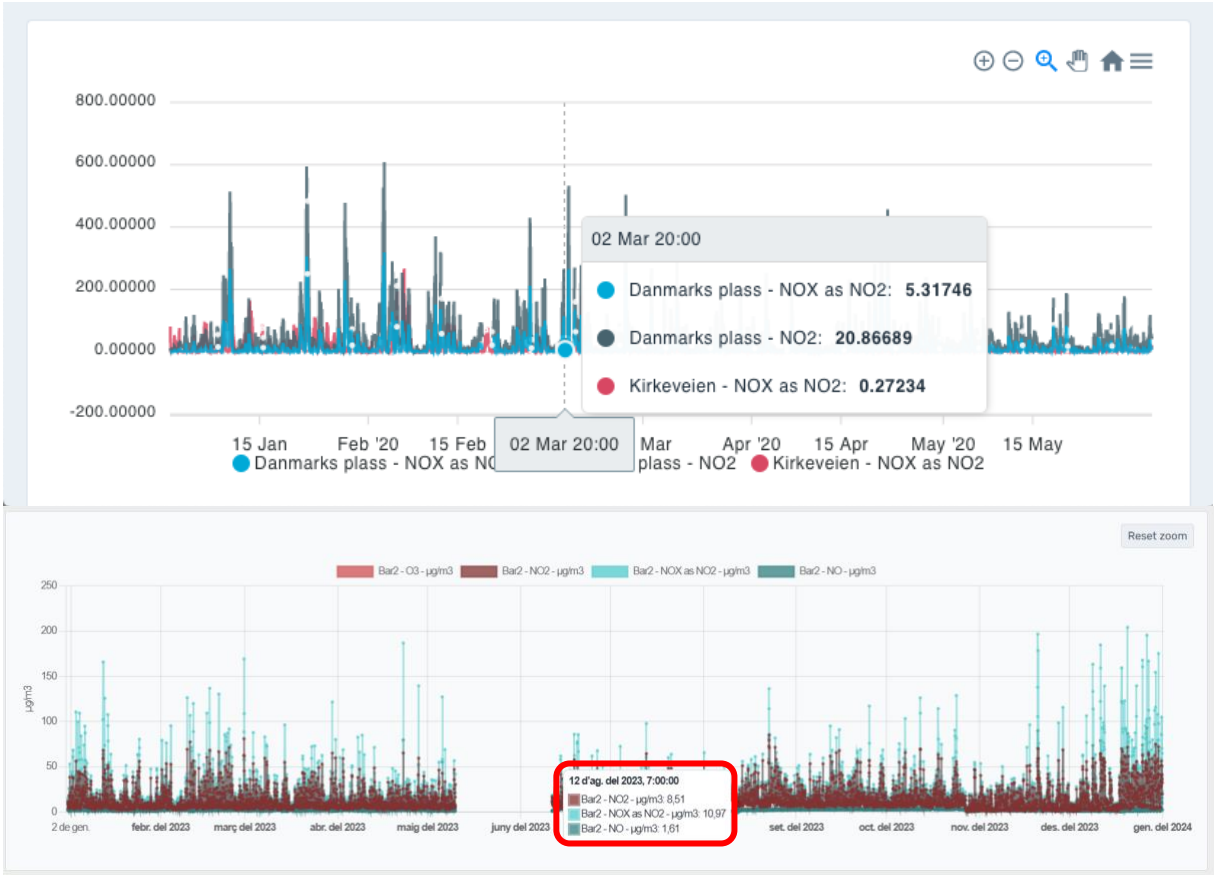


Figure 30: Historical data section – visualisation of specific data of selected timeseries buy hovering mouse over timeseries

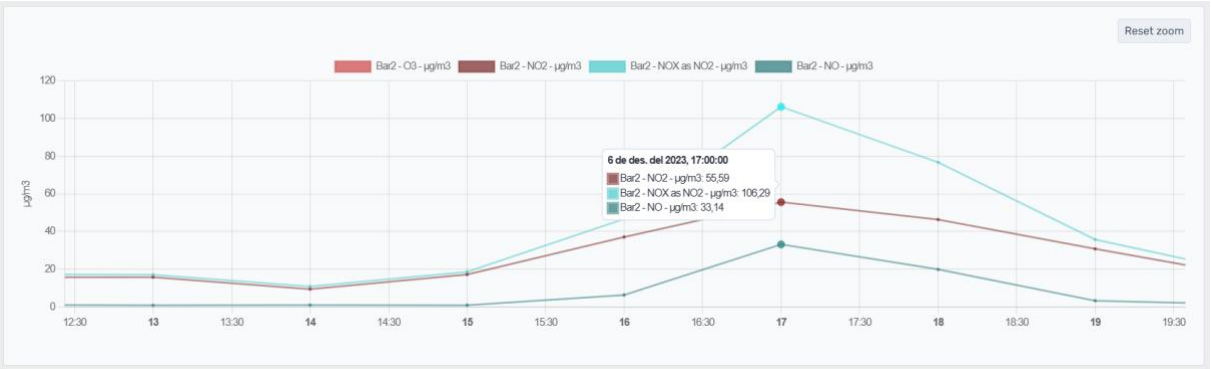


Figure 31: Historical data section – zoom in selected timeseries

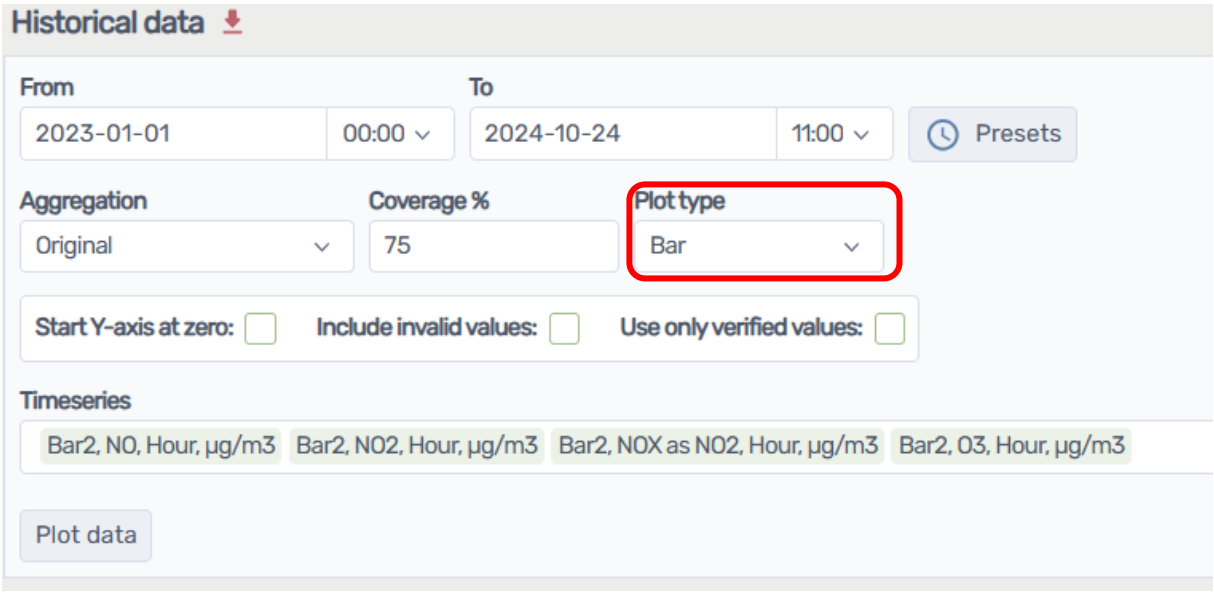


*Figure 32: Historical data section – select data as a **bar** graph in the "Plot type" drop-down*

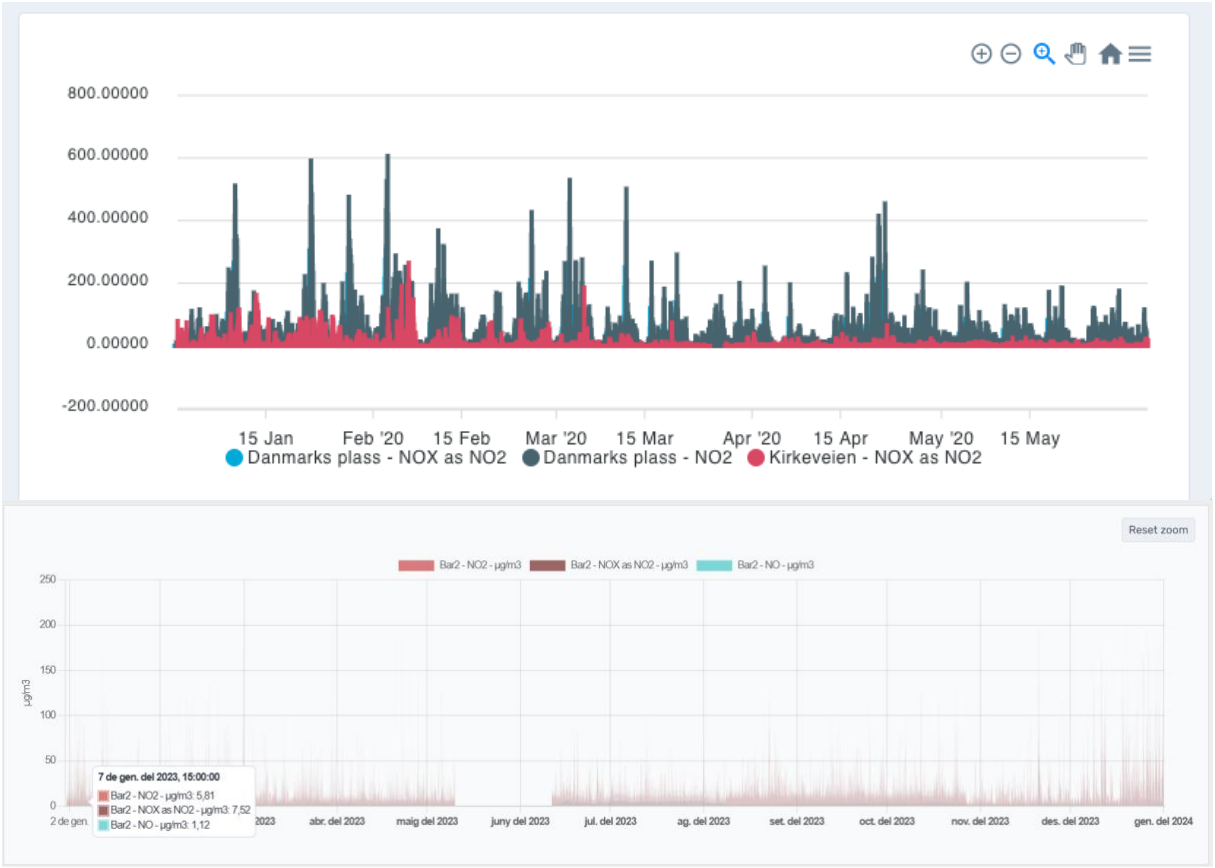


Figure 33: Historical data section – visualise data as a bar graph

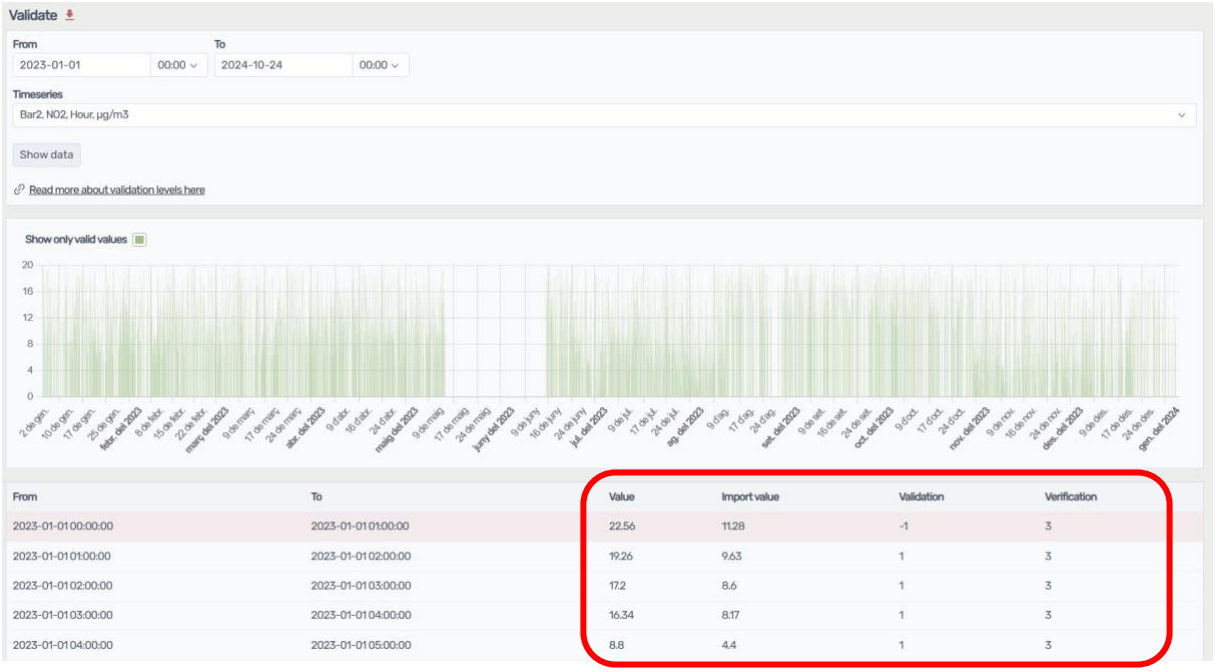
9 Data processing

Raven allows the processing of data timeseries. Currently, it includes 3 options:

- Convert -
- Calculate
- Scale

9.1 Scaled timeseries (validate)

In this section is possible to observe that the original value is higher than the imported value, which is the one that is selected as it's the one that has been validated through the varification number applied.



From	To	Value	Import value	Validation	Verification
2023-01-01 00:00:00	2023-01-01 01:00:00	22.56	11.28	-1	3
2023-01-01 01:00:00	2023-01-01 02:00:00	19.26	9.63	1	3
2023-01-01 02:00:00	2023-01-01 03:00:00	17.2	8.6	1	3
2023-01-01 03:00:00	2023-01-01 04:00:00	16.34	8.17	1	3
2023-01-01 04:00:00	2023-01-01 05:00:00	8.8	4.4	1	3

Figure ??: Quality control section – selection of the validated data

9.2 Calculated timeseries

9.3 Converted timeseries

In this section there's the possibility to convert the units from the data uploaded; in this case, for example, the initial units are ppbv and they've been converted into um/m3. There multiple options & units to convert the data depending on the need of the analysis.

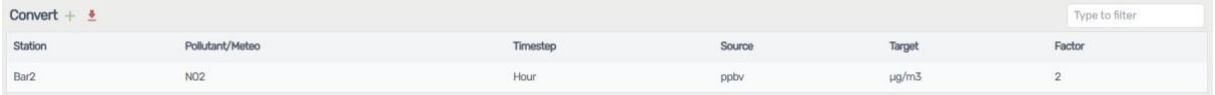


Figure ??: Import process section – convert units

10 Key elements for AQ e-Reporting (under development)

Under development.

11 Import of data – Manual import

To import data manually, go to the 'Import process' section in the side menu. Then, click on 'Manual import' where you should upload the files in '.csv' format needed to make the different graphs selecting your file ("Select your file") and then "Upload" it pressing the corresponding button as shown in Figure X.

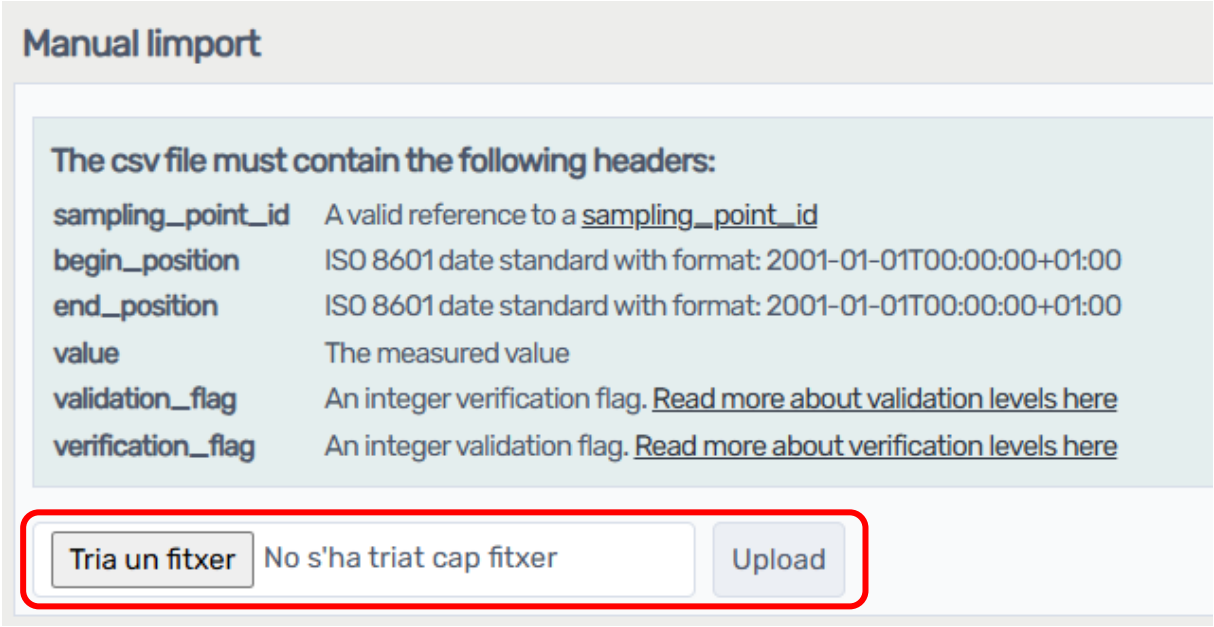


Figure ??: Manual import section – Select a file & Upload buttons to ensure the csv files is uploaded in Raven.

These files must contain the following headings, as shown below and in Figure X:

- **sampling_point_id**: A valid reference to a sampling_point_id
- **begin_position:** ISO 8601 date standard with the format 2001-01-01T00:00:00+01:00
- **end_position**: ISO 8601 date standard with the format 2001-01-01T00:00:00+01:00
- **value**: The mesured value
- **validation_flag**: An integer verification flag.
- **verification_flag**: An integer verification flag.

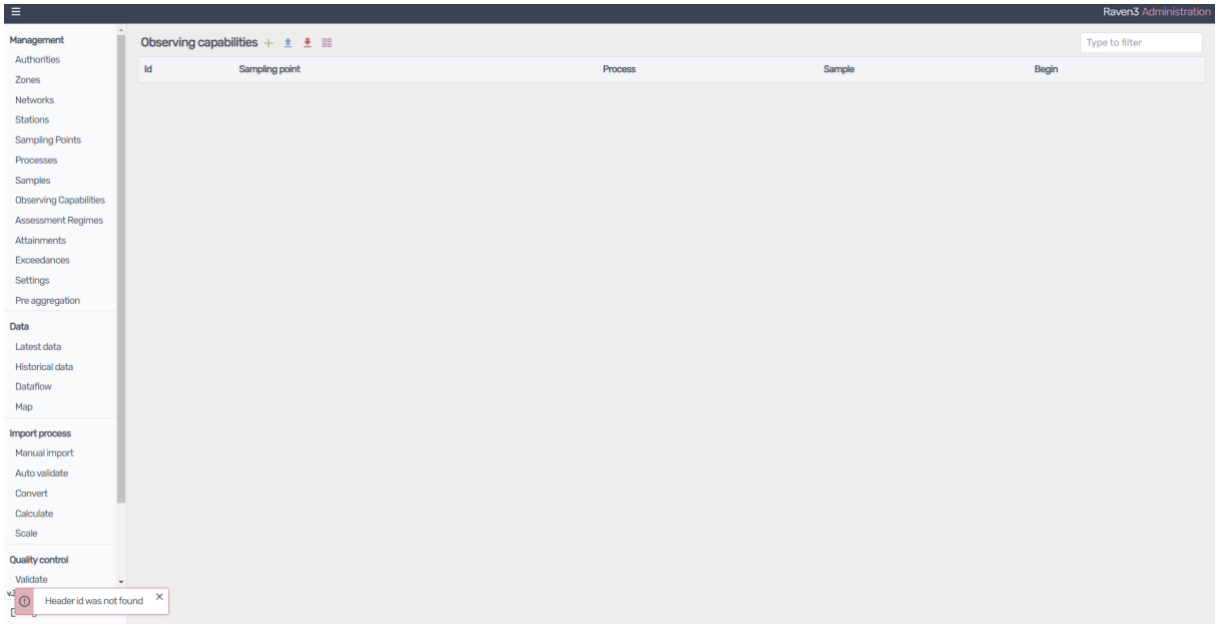
sampling_point_id	begin_position	end_position	value	verification_flag	validation_flag
SPO-ME0008A_00038_100	2023-01-01T00:00:00+01:00	2023-01-01T01:00:00+01:00	2.46	1	1
SPO-ME0008A_00038_100	2023-01-01T01:00:00+01:00	2023-01-01T02:00:00+01:00	2.2	1	1
SPO-ME0008A_00038_100	2023-01-01T02:00:00+01:00	2023-01-01T03:00:00+01:00	2.71	1	1
SPO-ME0008A_00038_100	2023-01-01T03:00:00+01:00	2023-01-01T04:00:00+01:00	3.67	1	1
SPO-ME0008A_00038_100	2023-01-01T04:00:00+01:00	2023-01-01T05:00:00+01:00	1.46	1	1

Figure ??: Manual import section – necessary heading in the ".csv" files

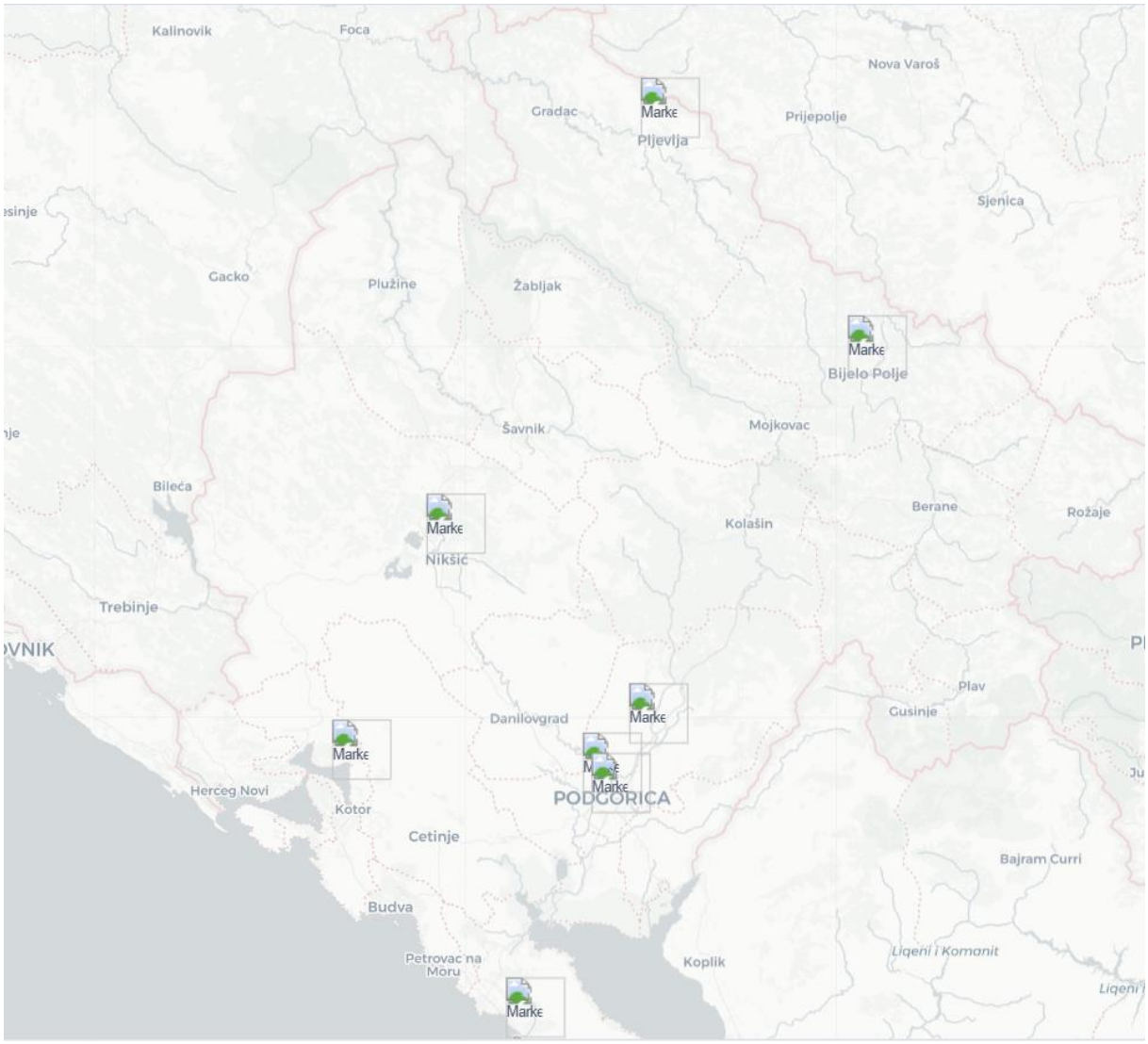
12 Common errors

Under development.

- When trying to upload csv file in “Observing Capabilities” we get the following error:



- Dataflow by
- Not uploading D in full
- Under E1a upload data with the wrong frequency (Metadata says A and data says hourly)
- Data with mixed time zone
- Hourly data with hours that extend for more than one hour
- Uploading D Dataflows in the wrong order
- Uploading C without zones and metadata
- TimeSeries – In the Historical data maybe would be good to specify that is not only that, it’s also the pollutant, ubication...
- In the map section:
    - The zoom in and out options (cross and minus), there’s something that underlines the icons and it’s confusing...
    - Also, when displaying some images from the stations on the map, the icons


Kalinovik
Foca
Nova Varoš
Gradac
Prijepolje
Pljevlja
Sjenica
Gacko
Plužine
Žabljak
Bijelo Polje
Šavnik
Mojkovac
Bileća
Berane
Kolašin
Rožaje
Nikšić
Trebinje
Plav
Gusinje
Danilovgrad
PODGORICA
Herceg Novi
Kotor
Cetinje
Bajram Curri
Budva
Petrovac na Moru
Koplik
Ljeni i Komanit